DIR 04751
CW
MI48106UYMUIVYMA FCWB
UNIVERSITY MICROFILMS INTL
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Framingham, Mass. and additional mailing offices ©1983 by CW Communications/Inc.

y; $44/year | August 15, 1983 | Vol. XVII, No. 33

UTERWORLD'S ANNUAL
RDWARE
ROUNDUP

Inside This Week
59 Minicomputers
From 20 Vendors
Next Week: Micros

Inside

When ridership on its subways and buses dropped 22%, New York's Metropolitan Transit Authority took quick action — including a five-year, $8.5 billion capital improvement program managed completely by a project tracking system. **Page 53.**

• • •

When the First Bank of Minneapolis decided in 1978 to integrate both voice and data commercially on the same private branch exchange, it had no idea that it would become a pioneer in this area. **Page 65.**

• • •

A 32-bit, virtual memory superminicomputer claimed to be the first designed for the Unix environment has been introduced by Pyramid Technology Corp., a California-based start-up company. **Page 73.**

• • •

Narrowing the gap that separates one vendor's machines from another's, Interlan, Inc. has unveiled a networking system and terminal server that can be used to communicate host-to-host, terminal-to-host or personal computer-to-personal computer. **Page 79.**

• • •

The Export Administration Act is unfair and discriminates against U.S. manufacturers trying to compete in the worldwide market, the American Electronics Association boldly stated in a bulletin sent to 2,300 computer and electronics industry executives. **Page 81.**

ICA Warns Plan Poses Problems For Communications Managers

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Communications managers may have to make some hasty decisions about whether to retain or ditch the equipment they currently rent from AT&T if a plan now before the Federal Communications Commission goes into effect, the International Communications Association told the commission this month.

"The communications manager . . . is not faced with a . . . situation in which new products . . . can be evaluated one at a time," noted the users group, whose members include the nation's largest companies. "Furthermore . . . the time frame . . . places intense pressure on many corporate budget cycles."

The ICA's comments were made in a statement on a plan for selling users the terminals they are now renting, at tariffed prices, from AT&T and other telephone carriers. Under the FCC's Second Computer Inquiry Decision, terminals — officially known as customer premises equipment — have to be detariffed.

A list of installed customer premises equipment that users can buy next Jan. 1 can be found on Page 8.

The plan, developed by AT&T, has been tentatively approved by the FCC. If it receives the commission's final approval, it will go into effect next Jan. 1.

One reason for ICA's unhappiness with the plan is that it sets up a separate timetable for detariffing and selling installed terminals, which the FCC calls "embedded customer premises equipment." All of this equipment would be detariffed on Jan. 1. AT&T Information Systems, Inc., formerly American Bell, Inc., would offer some of the equipment for sale immediately, but sale of the rest could be deferred as much as two years, until Jan. 1, 1986.

The plan includes a "price predictability program" that caps the monthly charges on leased business customer premises equipment after Jan. 1, 1984. However, this program would expire 18 months later — six months before some detariffed business terminals, such as electromechanical private branch exchanges, may be offered for sale.

By comparison, the price predictability program for residential telephones would not expire until Jan. 1, 1986, 24 months after it began.

AT&T Information Systems has promised that its sales prices for

(Continued on Page 8)

DEC's Annual Earnings Dive 32%

By Bill Laberis
CW Staff

MAYNARD, Mass. — Intensifying competition and increased outlays for new products and for research and development combined to hand Digital Equipment Corp. its first decline in yearly profits in 13 years.

The year-end results left DEC watchers divided about the future direction of the No. 2 computer company. While most analysts believe the worst has passed, several expressed doubt that DEC will ever regain the market momentum that until this year brought rapid annual growth and widespread user acceptance.

DEC's earnings dove 32% for the year ending July 2 to $283.6 million or $5 per share, compared with profits of $417 million or $7.53 per share in 1982. Revenues for the year were up 10% to $4.27 billion, compared with $3.88 billion a year earlier.

DEC'S SLIDE IN PROFITS

Period Ending	Revenues (% Change)	Earnings (% Change)
Oct. 2, 1982	$927.5 Million (10%)	$57 Million (-36%)
Jan. 2, 1983	$1.02 Billion (5%)	$61 Million (-38%)
April 2, 1983	$1.09 Billion (9%)	$80 Million (-26%)
July 2, 1983	$1.23 Billion (14.7%)	$86 Million (-29%)
Fiscal Year 1983	$4.27 Billion (10%)	$283.6 Million (-32%)

CW Chart

A company spokesman blamed intense price competition across several of DEC's major product lines for the weak profit performance.

Results for the fourth quarter showed a sharp revenue gain of nearly 15%, reaching $1.27 billion. But profits in the quarter continued the downward trend that started a year ago (see chart), closing the quarter down 29% to $86 million or $1.51 per share.

Order rates showed continued improvement in the fourth quarter because of the increased availability of

(Continued on Page 6)

Economy Forces Shift in Policy

Polls Find Fewer DPers Being Relocated

By Katherine Hafner
CW Staff

Corporations are relocating fewer DP employees than ever before as they begin to rethink their overall relocation strategies, an informal telephone poll of DP executives by *Computerworld* has found.

CW's findings were consistent with those of a study recently issued by Merrill Lynch Relocation Management, Inc., which concluded that relocations in 1982 dropped 11% from the year before.

While the 1960s and 1970s saw frequent geographical shifts among employees, the economic hard times and high interest rates of the 1980s have forced employers to reexamine their relocation policies, according to the Merrill Lynch study.

The chief reason for curbing the relocation of DP personnel — the high cost involved — is the same as for corporate employees in other divisions. However, there are some ways in which data processing's idiosyncrasies affect employees differently from others.

For example, DP people, who traditionally have transferred from company to company with great frequency, may be viewed askance by an employer considering investing about $50,000 in a relocation. "Sadly, we [management information systems] types have a reputation for being gypsies," commented James Kerwin, corporate director of MIS for Bell and Howell Co. in Chicago. "We aren't known for staying with an employer for 10 years, and that can make it very tough if the employer doesn't think the person they relocate will stay around."

This, coupled with the fact that DP specialists are no longer difficult to find and can more easily be hired locally, has caused DP executives to put a stop to frequent relocation and

(Continued on Page 4)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM reg. U.S. Pat. Off.

Editor John C. Whitmarsh
Managing Editor Rita Shoor
News Editor Cheryl M. Gelb
Technical Editor Timothy J. Scannell
Senior Editors:
Software Paul Gillin
Communications Phil Hirsch
Jim Bartimo
Systems Ed Scannell
Office Automation Jim Bartimo
Industry Bill Laberis
Features George Harrar
International Editor Susan Blakeney
Writer/Analysts: Marguerite Zientara
Tom Henkel
Staff Writers: Katherine Hafner
Patricia Keefe
Correspondents: Peter Bartolik
Washington, D.C. Jake Kirchner
West Coast Robert Batt
Jeffry Beeler
Features Coordinator: Barbara Van Scoyoc
Chief Copy Editor: Donovan White
Assistant Chief Copy Editor: Kathie Gow
Copy Editors: Dave Bouffard
Bruce Crane
Betsy Morse
Deborah Scaduto
Thomas Schmidt
Charlotte Ziems
Assistant to the Editor: June Fettig
Editorial Assistants: Joyce Furia
Mary DeCristoforo
Contributors:
Education J. Daniel Couger
Human Connection Jack Stone
Lecht on Science Charles P. Lecht
Softline Werner L. Frank
SPECIAL PUBLICATIONS
Computerworld Extra!
Editor Bruce Hoard
Copy Editor Patti Hartigan
Computerworld On Communications
Editor Bruce Hoard
Copy Editor Patti Hartigan
Computerworld OA
Editor Ann Dooley
Staff Writer Glenn Rifkin
Copy Editor Nancy Fleming
Computerworld Buyer's Guides
Editor Marcia Blumenthal
Copy Editor Rick LePage

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES & SALES OFFICES:

New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Phone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Bill Dunlop, Stephen Thomas, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1V FHN. Phone: 01278 3415/6.

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: 5215350.

France: Axel Leblois, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720.85.66.

Japan: Mr. Shohei Kurita, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217. Esteban H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-Cho, Chiyoda-Ku, Tokyo 101. Phone: (03) 230-41178. Telex: J26460.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: AA74752 COMWOR.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130835(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309. Telex: 1771300 ACHAME, 1777809 ACHAME.

Spain: Neil Kelley, Computerworld/Espana, Gravina, 13, Madrid 4. Phone: 231-23-85; 231-23-86, 231-23-88. Telex: 47894(CW E).

Denmark: Preben Engell, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11. Telex: 27566 cwdan.

Sweden: Bengt Matnfeldt, Computerworld/Sweden, Nova Media AB, Vartavagen 55, 11538 Stockholm. Telex: 8105099 NOVACW.

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.l., Via Rosellini 12, 20124 Milano.

Second-class postage paid at Framingham, Mass., and additional mailing offices. *Computerworld* (ISSN-0010-4841) is published weekly, except February (5 issues), April (5 issues), May (6 issues), June (5 issues), August (7 issues), September (5 issues), October (7 issues), November (6 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/ Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Copyright 1983 by CW Communications/Inc. All rights reserved.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc Box 880, 375 Cochituate Rd., Framingham, MA 01701. **ISSN 0010-4841/82 $3.00 + $.50**

$1.50 a copy: U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

ABP

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Centers on XL40 System

User to Push Suit Against Pertec

By Patricia Keefe
CW Staff

ELMHURST, Ill. — Although charges of negligence were dismissed against Pertec Computer Corp. in May, a computer service bureau here has decided to press forward with a $1.8 million lawsuit charging the firm with fraud, deceit and breach of contract.

The suit was filed two years ago in U.S. District Court in Chicago by Vanco Business Management, Inc. It is slated to go to trial this fall.

The suit's charges of negligence were dismissed on a pretrial motion because Illinois law prohibits recovery of economic damages due to negligence.

Vanco's suit alleges that in 1978, it was induced to purchase and lease portions of Pertec's XL40 turnkey system because of a series of "false and fraudulent statements" made by representatives of Pertec. Those statements led the plaintiff to believe that the XL40 system "would accommodate all of its processing requirements," Vanco said. The total value of the contract was $96,768.80.

As a result of its purchase and lease of the XL40, Vanco claims, it suffered the loss of at least two clients, the destruction of client files and data, repeated system failures and "loss of profits and income and damage to its business reputation."

Pertec said in its response to Vanco's suit that it "categorically denies" all charges and knowledge of the nature or requirements of Vanco's computer service bureau, according to its attorney, Richard Rappaport. The vendor maintained that Vanco has not "suffered any compensatable damages" as a result of its use of the XL40 system.

Pertec has countersued for a yet undetermined figure which it said Vanco has failed to pay under its purchase and lease agreements.

In the suit, Vanco claims that while Pertec designed the XL40 as a data entry system to be used with other mainframe systems, the vendor sold it as a stand-alone computer — even though, according to the suit, the firm had very little experience with the application of the XL40 in stand-alone applications.

'Serious Design Deficiencies'

The suit also says it was not until summer 1981 that Vanco learned from employees of Sperry Corp., successors to Pertec's service and maintenance obligation, "that the XL40 system should never have been sold as a stand-alone system and had serious design deficiencies in such an application for [Vanco's] business needs."

The service bureau further maintains Pertec representatives assured it that the imminent introduction of a new software system under development — called Axel — would cure the repeated system errors and breakdowns. However, Axel was never made available to Vanco, according to its attorney, Arthur Solomon. He added that this assurance helped to delay Vanco's legal action.

When contacted last week, Pertec attorney Rappaport was unable to state whether Axel was ever developed or released.

Vanco operates under the name of Management-Data Services, Inc. It provides data processing services to approximately 40 clients, primarily physicians and collection agencies. Billing services are performed for its medical clients.

Also provided is an accounting system for remittances to several thousand clients of the collection agencies and cash reports.

The firm has since returned leased portions of the XL40 system to Pertec and now uses other components that it had purchased from Pertec for data entry to an IBM System/38, which it bought in October 1982.

Corrections

In Charles P. Lecht's article "For Whom the Bell Tolls ... For Free" [CW, Aug. 8], the "variable bit Hamming code" mentioned should have read "variable bit Huffman code."

In "Stand-Alone System Includes Array Processor Architecture" [CW, Aug. 1], the vendor's name should have been Analogic Corp. In addition, the key feature of the machine is its integration of the array-oriented language, APL, with the processing power of the array processor. The system also incorporates APL functions in microcode, which Analogic said results in high APL performance on large problems.

This Week

HARDWARE ROUNDUP 42

IN DEPTH

Tapping External Data Sources ..... Follows Page 64
University's Role Is Education ID/11
Managing Employee Careers ID/21

NEWS

CAB Changes Stance on Airline Systems Issue 4
IBM Asks Order Forcing Hitachi to Drop Suit 7
Concern Builds as Strike Continues Against Bell 9
U.S. to Ask Prison for Man Guilty of Illegal Export .. 10
AT&T Not to Pay Handling Expenses: Greene 11
IBM's LADT Petition Stirs Opposition, Support 12
AT&T's Cellular Radio Nears Commercial Use 13
Hot Summer a Sign of Success for Forecasters ... 14
Exec Credits Success to People-Blending Skills ... 15
Mini User Reports Some Strange Problems 16
Airborne Automation Takes Over Flying, Landing .. 17
International Report 18
Staring at CRT Distorts Color Perception: Trio 19
Managers on the Move 20
Mini Models New Plants' Environmental Impact ... 22
Off the Press 23
DDP Net Puts Brakes on Auto Bureau's Backlog .. 24
State Program Uncovers Odometer Tampering 25
Relocation Firm Picks Up Revenues With Net 26
Report Writer Offers Oil Firm Quick Data Access .. 27
Exec: Telecommuting Sharpens Manager Skills ... 28
Justice Department Addresses Ecom Rate Hikes .. 30
Organization to Add General Ledger Tools 31
Financial Journal Switches to In-House System ... 32
Atari Resolves Programmer/System Dilemma 33
Tool Eases Firm's CICS Testing, Debugging 34
Mini Helps Plant Retailer Monitor Flower Growth .. 36
Deltak Training Series Out for IMS/VS Operators .. 37
WP System Ties to Hospital's Central Data Base .. 39

EDITORIAL

Editorial: No More Than a Promise? 50
Softline: Structure vs. Prototype 51
Human Connection: Computer Illiterates 51

SOFTWARE & SERVICES

Tracking System Keeps MTA in Line 53
Honeywell Adds Interactive Data Base Package ... 55
'Logic' Finds Lowest Costs 57
Scada Program Supports DEC Systems 58
Fixed Assets Package Offered 60
DEC Minis Get MS-DOS 61

COMMUNICATIONS

Bank Integrates Voice, Data With PBX 65
Modem System Boasts V.29 Compatibility 66
Com Key, Horizon Get Price Cuts 67
Translator Ties CPU to Ascii Units 71
RTA-327II Measures Net Performance Level 72

SYSTEMS & PERIPHERALS

Pyramid 32-Bit Mini Designed for Unix 73
Personal CAD System Combines Turnkeys 74
Printers, Modems Debut 75

OFFICE AUTOMATION

Interlan System Meets Ethernet, IEEE Standards .. 79

COMPUTER INDUSTRY

AEA Pushes Congress to Streamline EAA 81
Fierce Competition Forces Layoffs at Osborne 81
Japanese Chip Sales to Grow 18% 83
Computervision Inks Remarketer Pact With IBM ... 84
Emerging AI Field Seen Taproot of Computing 85
Micros Seen as Vanguard of Industry Growth 88
Nashua Reaches Accord to Restructure Debts 89
Encore Acquisitions May Come Slow: Analysts ... 91

ADVERTISING INDEX 126

Watch this space for
The IDEAL Solution

In September,
ADR will release a product
that will redefine
the industry's concept
of fourth-generation application
development technology.
All other products
will be found to be
less than IDEAL.

APPLIED DATA RESEARCH

Route 206 & Orchard Rd.,
CN-8, Princeton, NJ 08540

CAB Changes Stance on Airline Systems Issue

By Robert Batt
CW West Coast Bureau

WASHINGTON, D.C. — A recent move by the Civil Aeronautics Board (CAB) could cause a major upheaval in the airline industry's computer reservations systems.

The CAB last week invited airlines to comment on the existing reservations systems and propose ways to amend alleged abuses. The CAB's call for comments, widely believed to be an acknowledgement that all is not well with the current situation, followed concerted pressure from Congress, the U.S. Department of Justice and smaller airlines.

The move, industry officials said, could lead to changes in the way tens of thousands of domestic travel agents book reservations with airlines, hotels and car rental agencies. If it does, the losers would be American Airlines and United Airlines, which currently dominate the airline reservations industry.

Thirty-Day Deadline

The CAB gave airlines 30 days in which to present their cases in writing. This will be followed by up to 15 days of oral testimony and a 30- to 60-day period for CAB staff to propose new rules.

"We expect to have specific rules governing the use of computer reservations systems by January or February next year," CAB Chairman Dan McKinnon said in a recent telephone interview.

According to the CAB, American's Sabre network and United's Apollo network together account for 80% of U.S. travel agents' use of computer reservations systems. The remaining 20% of the business goes to Eastern Airlines, Trans World Airlines and Delta Air Lines. An estimated $20 billion in domestic air transportation was bought through computerized systems in 1982.

Many air carriers, especially the smaller ones unable to start their own systems, have charged that Sabre and Apollo incorporate anticompetitive biases into their programs. The air carriers maintain that:

- The systems bias the information they provide so that travel agents will book passengers on American and United flights, even when cheaper or more convenient carriers are available.
- The two giants discriminate in the fees they charge for competitors to use their systems and pressure travel agents to book reservations on their flights.
- United and American have proprietary rights to information about changes in schedules and ticket sales of other airlines, which gives them an unfair competitive advantage.

Any major change in the current system would be a severe blow to American and United, which between them have spent over $400 million in developing their systems.

Decision Sparks Both Anger, Anticipation

The decision by the Civil Aeronautics Board (CAB) to look into alleged abuses by the nation's two top computerized reservations systems brought swift responses from airline and travel executives.

"We do not accept the allegations that our systems are operated in an anticompetitive way," said Lowell Duncan, vice-president of corporate communications at American Airlines. "We are open to adjustments, but if rules are imposed that make our system untenable, we may choose not to remain in the computerized reservations business."

Duncan said American had invested $160 million in its Sabre system and took a gamble by pioneering a new area. He complained that other airlines that refused to take the gamble are now imploring the government to make the system available to them at no cost.

United Airlines offered no comment on the latest developments, except to say it would make its recommendations to the CAB.

The CAB decision was greeted as a major victory by many of the smaller airlines, with some of them making clear their determination to see United and American divested of their systems and an independent third-party system set up.

"This is a fundamental structural problem within the industry which cannot be fully solved without divestiture. We hope these systems can be operated by agencies outside of the airlines," said Marvin Cohen, ex-chairman of the CAB and now an attorney representing Pacific Express, Inc., a San Francisco-based airline.

Clark Onstad, vice-president of government affairs at Continental Airlines, expects the CAB's move to "eliminate hundreds of millions of dollars in incremental revenue that currently flows into the coffers of United and American because of the bias in their systems, and I expect it to have an impact on market share."

However, as the battle over the future of computerized reservations heats up, United and American may find themselves with valuable allies in the form of the nation's travel agents. Commenting on the latest moves, Larry Clark, national director of the American Society of Travel Agents said, "We are concerned about the CAB decision. We do not feel the legislative arena is the proper place to resolve these complex issues. If the system is restructured so as to perform in a less comprehensive way, it will be the consumer who will suffer."

Fewer DPers Being Moved

(Continued from Page 1)

to relocate a person only if the move can be justified.

In the *Computerworld* survey, six of the 10 DP executives interviewed said that relocation at their companies is not only down from last year at this time, but that there is considerably less movement than five or 10 years ago. Two others said relocation is stable from last year but down from five or 10 years ago. The two remaining managers said that relocation is up from last year, but only because a new data center was established and relocation was unavoidable.

"We have a couple of hundred MIS people around the country and we haven't done any relocations in a year and a half," Bell and Howell's Kerwin commented. "I don't think that will turn around at all. The economy is keeping folks a bit closer to home. This last recession hit MIS people, too."

Additional cost considerations cited by the DP executives include the increasing number of working spouses, which makes employees less willing to uproot themselves, and the unremitting high cost of housing in certain areas. Because most large companies assist a relocated employee with a mortgage and cost-of-living differential, moving an employee to a high cost-of-living area is often a major investment.

"It gets very expensive," a spokesman for Occidental Petroleum Corp. in Houston said. "Relocating people to Los Angeles is the worst. It can cost $45,000 to $75,000 for the move."

In addition to the obvious solution of relocating employees less, high personnel costs have, in turn, made some DP executives think seriously about centralizing their DP facilities. "We're rethinking our strategy completely," reported James Yoakum, vice-president of information systems at Marriott Corp. in Washington, D.C. "With personnel costs a major consideration, we're considering a more centralized approach [to DP facilities]."

The cost of shifting people from place to place while maintaining a decentralized operation was of concern to Kenneth Hawes, director of information systems at SCM Corp. in Stamford, Conn. Hawes said his company recently reconsolidated its DP facility to Durham, N.C., a move that accounted for the relocation of 36 people in 1982.

"That high number of relocations is an anomaly," Hawes said. "Otherwise, our turnover has been at less than 5% in the past two years."

By staffing one central facility, Hawes pointed out, he has achieved a large reduction in staff. "We've looked at it as a very cost-effective situation," he said.

"I laugh at some of the articles about decentralization," Hawes added. "It's my opinion that we'll actually end up with a lot of intelligent terminals tied to a central mainframe. It's much more cost-effective that way."

Buy, lease or rent TI's new Professional Computer from MTI.

The new TI 850 - 150 cps, designed to be compatible with your desktop P.C.

We are distributors of Texas Instruments' full line of portable terminals, matrix printers and Professional Computers.

In addition to offering you rental and leasing opportunities, MTI's experienced personnel will train you on your equipment either in MTI's classroom, or at your company. And we carry the software packages you need. Database management, electronic spreadsheets, word processing and much more.

We also have a professionally-staffed service department and an extensive parts inventory, so that we can have your equipment up and running within one day of your call. And for those who want to save the expense of a service call, we offer depot service.

Whether you buy, rent or lease our equipment, you'll find MTI is the one source for all the terminals, peripherals, systems, applications expertise and service you'll ever need. At good prices. Call us.

New York: 516/621-6200, 212/767-0677, 518/449-5959
Outside N.Y.S.: 800/645-6530
New Jersey: 201/227-5552
Ohio: 216/464-6688

mti systems corp.

AUTHORIZED DISTRIBUTOR
Texas Instruments
Data Systems Group

Applications Specialists & Distributors, New York, New Jersey and Ohio.
DEC, Intel, Lear Siegler, Texas Instruments, Dataproducts, Diablo, 3Com, Hazeltine, Racal-Vadic, Digital Engineering, MICOM, Cipher, U.S.Design, Protocol Computers, MicroPro, Microsoft, Polygon and Select.

MACH 2

SYBACK is the fastest dump restore for VM. SyncSort CMS is the fastest sort.

Call (201) 568-9700.

Speed's the name of the game in these systems.

syncsort INC.

VM systems have turned out to be one of the surprises of our time. They've become more popular than anyone could have imagined, including even IBM.

Now VM promises to be more popular than ever. Because we've succeeded in breaking through two barriers that formerly restricted VM users.

Last year we brought you the first really *fast* sort program for VM, SyncSort CMS. It required minimal resources, and it was a joy to use. As a result, it became an overnight success. Today it has over 500 users.

This year we introduced SYBACK, the first high-performance backup, restore and copying program for VM. Almost immediately all other VM dump-restore programs became obsolete.

UNRIVALLED PERFORMANCE: Both SYBACK and SyncSort CMS make data move like greased lightning. Here are the individual flight characteristics of the VM speedsters:

- **SYBACK** — Compared to any other VM dump-restore program, SYBACK will save you an astonishing amount of computer resources. Up to:
  - **50% in Elapsed Time;**
  - **30% in CPU Time;**
  - **75% is SIOs.**
- **SyncSort CMS** — Compared to sub-sonic sorts now in use, SyncSort CMS will save you up to:
  - **50% in VTime;**
  - **60% in TTime;**
  - **75% in SIOs.**

HOW WE DID IT: We developed a new Fluid Buffering Technique (FBT) that reflects our expertise in handling I/Os. FBT greatly increased the speed of sorting in OS and DOS. (Maybe that's why we have over 8,500 SyncSort users.) Now we've applied the same technique to our VM dump-restore program.

SUPER PRODUCTIVITY: Like all SyncSort products, SYBACK and SyncSort CMS include a full range of sophisticated features to reduce "people time." **Both these programs have tremendous operational versatility, and they're extremely user friendly.**

UNSURPASSED SERVICE: It's so good that more than 85% of all client requests are resolved within 24 hours.

If you'd like to find out how good our VM twosome really is, try this simple test. Ask our "competitors" if they'd like to benchmark their programs against SYBACK and/or SyncSort CMS.

They'll undoubtedly show a natural reluctance. And that is probably the best recommendation of all!

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

DEC Not Expected to Regain Market Momentum

By Bill Laberis
CW Staff

The consensus of analysts interviewed last week on DEC's fiscal 1983 performance was that the market has changed in recent years to the point where DEC will not regain the market momentum it once enjoyed.

The primary reasons: increased price competition, fostered in great part by IBM; the inability of DEC's management to react quickly and decisively to market changes; and the growing threats to DEC's strength, both on the high end from its traditional minicomputer competitors, and the low end from increasingly powerful microcomputers.

"The rules of the game have changed, and DEC will never see the same results it showed in the past," according to Marc G. Schulman, the vice-president who tracks DEC for the First Boston Corp. "Revenues this year were below what management thought they'd be, and they've got problems on the cost side. Expenses are growing too fast this early in the recovery cycle."

Commenting on some of DEC's new product offerings, Schulman said shipments of the company's low-end personal computer line "are about on course," but said the Professional, its top-of-the-line personal computer, "has some problems." Unlike the IBM Personal Computer, the Professional runs on a proprietary DEC operating system, "which is not up to snuff," Schulman maintained.

Schulman joined Frederic Cohen, DEC analyst with L.F. Rothschild, Unterberg, Towbin, in downgrading estimates for DEC's earnings next year. Both also attributed potential long-term problems to the increasing share of DEC's revenues derived from low-end products, which typically carry lower profit margins than high-end offerings.

Cohen recently removed DEC from his company's list of recommended stocks, citing what he termed disappointing progress in DEC's personal computer business. Cohen said further that Data General Corp.'s new MV10000 has upstaged DEC's high-end VAX-11 series of superminicomputers, DEC's bread-and-butter line.

Sonny Monosson, a third-party seller of DEC equipment and publisher of the "Monosson on DEC" newsletter, criticized both DEC's product strategy and management structure.

According to Monosson, DEC's much-touted management reorganization this year, which sought to decentralize the decision-making process, "is just a smoke screen, a big camouflage move for the matrix-type management structure still in place."

Monosson said DEC still has too many people involved in making key product and marketing decisions. "So they'll continue to get burned in new product areas because they just can't react fast enough, like IBM can," Monosson said. "Unless they change their style, you'll see repeats of what happened with their personal computer, where they just buried their heads in the sand," he predicted.

DEC, Monosson said, lost the confidence and trust of many large users when it scrapped its Jupiter high-end project in May [CW, May 30]. The company "shocked" users because "of DEC's repeated assurances that the new processor would materialize."

Carol E. Muratore, a DEC analyst with Prudential-Bache Securities, Inc., was more optimistic about DEC's immediate future than other analysts interviewed last week, saying that healthier profit margins will return when the company's underutilized plants operate closer to capacity as the economy improves.

Muratore added that DEC's stepped-up research and development spending of the past six months will help the company get its new products out the door "in a more timely fashion than we've seen in the past."

DEC's new management organization, she said, will prove "well suited to the company's product strengths."

DEC Earnings Take 32% Dive

(Continued from Page 1)

the company's new products, according to Alfred Bertocchi, vice-president of finance and administration. Bertocchi added that demand for DEC's office automation products has been particularly strong, and "the company is anticipating improved operating results in fiscal 1984 due to its strong product position ... and a recently realigned marketing organization more closely focused on the company's key markets."

But asked if DEC would again realize the growth rates of past years, another company spokesman said, "There is no question we have had to lower our goals. It will take several years to get back to the profits and revenue growth of before. It's something we aspire to, which is not saying we can."

Calif. System Sniffs Out Unemployment Schemes

By Katherine Hafner
CW Staff

WASHINGTON, D.C. — As recently as eight years ago, law enforcement officials relied on anonymous telephone calls and tips for sniffing out unemployment insurance fraud schemes.

That all began to change in 1976 when Robert Keel, a retired Los Angeles detective, joined California's Employment Development Department. Keel introduced a computerized system for detecting con artists who start up phony businesses and hire fictitious employees, then lay them off and wear disguises to pick up the unemployment checks.

"When I came into the department, one of the first cases I ran into was a false company," Keel said. "I was a little dismayed that we didn't have some sort of reliable detection system that was good enough to address the issue in a state this size. At that time, California was paying out about $2 billion a year in benefits, and we had a hand tally system to keep track of fictitious employer schemes."

Though such schemes were far from epidemic, with four or five big cases cropping up each year, Keel set out to replace the manual system. Working with others in the department, he gathered all pertinent information regarding past cases. With federal funding, he hired a consultant knowledgeable in both white-collar crime and computer programming to develop the software.

By 1978, the system was operational. "We ended up with an ongoing tracking file of all newly registered employers in the state," Keel said. "The very first day the system was going, we detected a fictitious employer."

The department's analyst and special investigator work on Four Phase Systems, Inc. terminals emulating IBM 3270s linked to the state Health and Welfare Agency data center's IBM 370 mainframe.

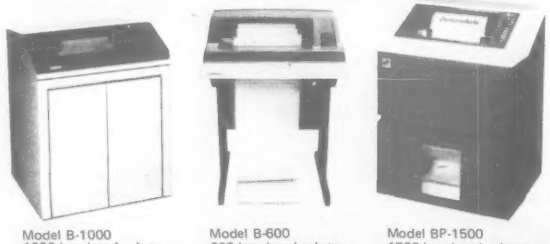
"They're looking for certain criteria," explained Gary Richardson, a programmer analyst at the department. "When the criteria are met, the employer is keyed in on, matches are based on previous cases and once they find a pattern, they decide whether to investigate or not."

Keel has found that the automated system not only acts as a deterrent, but fictitious employer schemes are now uncovered much earlier in the game. "Under the old system, they were into us for $100,000 before we even knew they existed, and they'd already flown the coop to steal from another state," Keel said. "Now we usually catch them before they've stolen any money, and the minute they steal anything we're all over them like ants on honey."

Nearly 30 states have since set up or plan to set up similar computerized profiles of phony employers. The U.S. Department of Labor is also giving each state $6,000 to copy California's method, at a much lower cost than starting from scratch. "We think that taking [California's] software and adapting it to any state's computer system is a wise investment," noted Carolyn Golding, director of the U.S. Labor Department's Unemployment Insurance Service.

"The computerized profiles give us a very active tool we can use that's far better than hot tips and telephone calls," Golding said. "It also has something else — technology is working in our favor rather than against us. This is the prevention and early detection side of what you read about when you read about computer fraud."

Buy, lease or rent the latest Dataproducts line printers from MTI.



Model B-1000
1000 lpm band printer

Model B-600
600 lpm band printer

Model BP-1500
1500 lpm band printer

We are authorized Dataproducts stocking distributors. So we get them first, and fast.

Our Dataproducts printers range from 200 to 1500 lines per minute, are plug-compatible with all popular minicomputers, and cost thousands less than the identical printers from the minicomputer vendor. And there's no waiting. MTI also specializes in setting up remote line printer stations.

We also have a professionally-staffed service department and an extensive parts inventory, so that we can have your equipment up and running within one day of your call.

Whether you buy, lease or rent our equipment, you'll find MTI is the one source for all the terminals, peripherals, systems, applications expertise and service you'll ever need. At good prices. Call us.

New York: 516/621-6200, 212/767-0677, 518/449-5959
Outside N.Y.S.: 800/645-6530
New Jersey: 201/227-5552
Ohio: 216/464-6688

mti systems corp.

Applications Specialists & Distributors, New York, New Jersey and Ohio.
DEC, Intel, Lear Siegler, Texas Instruments, Dataproducts, Diablo, 3Com, Hazeltine, Racal-Vadic, Digital Engineering, MICOM, Cipher, U.S.Design, Protocol Computers, MicroPro, Microsoft, Polygon and Select.

IBM Asks Order Forcing Hitachi to Drop Suit

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — IBM last week urged a federal court to order Hitachi Ltd. to drop a lawsuit that might allow the Japanese company to retain trade secrets it has already admitted to stealing from the industry giant.

In the same Aug. 8 motion, IBM also asked the court to begin as soon as possible the trial phase of the firm's 11-month-old civil suit against Hitachi.

IBM's motion before U.S. District Court Judge Spencer Williams seeks to bar Hitachi from proceeding with a lawsuit the Tokyo-based company filed last month in Japan against its American competitor. The effect of the Japanese litigation would be to nullify a 1982 federal court order requiring Hitachi to return all the proprietary systems technology it had stolen from the U.S. firm, IBM's attorneys said in their filing.

The injunction covers a wide assortment of purloined IBM trade secrets and documents, including 11 volumes of the "Adirondack" workbooks, which contain detailed designs of the company's latest generation of hardware.

Last Nov. 10, Hitachi agreed to abide by the terms of the federal court order. But nearly eight months later, in Japan, the vendor filed a lawsuit that rejects calls for the same IBM technology to be surrendered to its owner. The American company "has no right to enjoin Hitachi" from using information in the disputed IBM documents "to design, develop, manufacture or market any computers or computer-related equipment," the Japanese affidavit said.

IBM blasted the Hitachi suit as a "direct move to oust [the federal court] of a portion of its jurisdiction and to eviscerate [its Nov. 10] injunction."

Elsewhere in last week's motion, IBM urged Williams to advance the trial for the firm's civil suit "to as early a date as possible." By undertaking "disruptive and duplicative" legal action in Japan, "the defendants have ably demonstrated their ability to bring this [civil] action to trial earlier" than they had originally indicated, the IBM motion said.

Initiated last Sept. 16, IBM's civil litigation seeks to deny Hitachi the use and benefit of all the trade secrets it reputedly swiped from the industry giant during late 1981 and the first half of 1982. The suit — and its accompanying criminal complaint — were the legal by-products of a highly publicized trade-secrets theft case that burst on the scene last summer following a successful Federal Bureau of Investigation sting operation.

Slapped with conspiracy indictments as a result of the eight-month undercover investigation were Hitachi, Mitsubishi Electric Corp. and more than 20 of their employees or alleged agents. Last February, Hitachi pleaded guilty to the criminal charges against it and received a $10,000 fine, the maximum penalty under U.S. law.

The outcome of the criminal side of the trade-secrets theft case is expected to have no impact on the resolution of IBM's civil suit.

R&D Firm To Start Up

MINNEAPOLIS — Honeywell, Inc. and Swedish-owned Ericsson Information Systems have announced plans to establish a research company to develop voice and data communications products for the U.S. market.

Slated to begin operations in October, Honeywell/Ericsson Development Co. will be based in Dallas. The company will be staffed by 150 technicians to be transferred from Honeywell and Ericsson operations.

The two companies also announced their intention to sign technology exchange and licensing agreements whereby Honeywell will acquire an interest in Ericsson Information System's advanced private branch exchange and packet-switching technologies.

"...right in the headline, tell them we've dropped Silent/Scribe™ printer prices by 20%. Then tell them how we did it."

Jack Weaver
Chairman, Anadex, Inc.

O.K. Jack, here's how we did it. We launched one of the most comprehensive cost-reduction programs imaginable.

We took a close look at the way our products flowed through the plant – from receiving inspection to the box the printers are shipped in. In some areas we combined operations; in others they were separated. We put in automation where we felt it made sense; but we kept skilled manual craftsmanship where quality might otherwise be compromised... Porsche does the same thing for the same reasons.

In marketing and sales, we developed and carried out a game plan that allowed us to grow in a methodical manner. This systematic approach to increased sales led to an economy of scale which, in turn, led to further reduction of material costs and increases in production efficiency. (Our new, expanded facility which we move into this Fall is a part of this plan.)

Silent/Scribe
Model DP-9000A

Throughout the whole cost-reduction program, we constantly looked for ways to tighten up quality control. Pride in workmanship and the quality attitude caught on. Now virtually everyone at Anadex is a quality control inspector.

One area where we didn't cut a dime is Customer Service. Anyone who buys an Anadex printer can still pick up the phone and dial our toll-free numbers for free technical support. And we plan to expand our TRW Service Centers even beyond the present 60 locations.

How does the cost-reduction program affect the customer? It means that after August 1, 1983 he can buy a 100% professional printer for 80% of what it was.

Same printer. Same service. 20% less cost. That's got to be good news.

Call (800) 792-7779
In California Call (800) 792-9992

Anadex

©Copyright 1983. Anadex, Inc.

MADE IN USA FOR THE WORLD

Anadex. Out front and staying there.

ANADEX, INC. • 9825 De Soto Avenue • Chatsworth, California 91311, U.S.A. • Telephone: (213) 998-8010 • TWX 910-494-2761
U.S. Sales Offices: San Jose, CA (408) 247-3933 • Irvine, CA (714) 557-0457 • Schiller Park, IL (312) 671-1717 • Wakefield, MA (617) 245-9160 Hauppauge, New York, Phone: (516) 435-0222 • Atlanta, Georgia, Phone: (404) 255-8006 • Austin, Texas, Phone: (512) 327-5250
ANADEX, LTD. • Weaver House, Station Road • Hook, Basingstoke, Hants RG27 9JY, England • Tel: Hook (025672) 3401 • Telex: 858762 ANADEX G
ANADEX GmbH • Behringstrasse 5 • 8752 Mainaschaff • Frankfurt, W. Germany • Tel: 011-49-06021-7225 • Telex: 4188347

ICA Warns of Problems With Detariffing Plan

(Continued from Page 1)

business customer premises equipment will not, "in the aggregate, exceed net book value plus transaction costs" — that is, the current market value of the equipment plus the administrative, warranty and marketing expenses associated with preparing it for sale. But ICA objects to use of aggregation, contending that the sale price of each type of terminal should reflect the average depreciation of that equipment.

Using an aggregated net book value could allow AT&T to charge an inflated price for the terminals that sold well, ICA said. Buyers would then pay a hidden subsidy covering depreciation expense, which rightfully should be borne by the less popular terminals.

Ill-Defined Transaction Costs

Another problem with the FCC's tentative plan, the ICA said, is that it fails to define precisely "transaction costs."

The association said that even if the commission requires AT&T Information Systems "to establish [customer premises equipment] sales prices that approximate [true] net book value, the level of the accompanying transaction fee, if set too high, could discourage actual customer purchases ... [AT&T Information Systems] clearly has the incentive to overestimate these charges, particularly with respect to embedded business [customer premises equipment] product lines that it has not voluntarily placed on the market."

AT&T Information Systems supplied some evidence to support this concern in an Aug. 2 comment on the proposed customer premises equipment detariffing plan. For business communications users, the big news in that statement was that, in addition to the products announced earlier, some 1A key systems would also be offered for sale before Jan. 1, 1986. But the company added that "a sale program for 1A Key will necessarily involve high volumes of customer contacts.

"The complex and diverse nature of the equipment means that a large presale effort, frequently including inspections by [AT&T Information Systems] technicians, will be required to identify a system's capabilities and arrive at a firm price quote. Follow-up visits will be required to identify and label customer-purchased equipment."

In addition, AT&T Information Systems "will require time to develop systems to support purchased 1A Key equipment, including parts pricing and distribution, documentation and customer records."

Pros and Cons

Allowing as much as two years to elapse between the detariffing of embedded customer premises equipment and the start of a sales program would be good for AT&T Information Systems but bad for its customers, according to ICA.

It said the company would earn rental income during this period that it would otherwise have to forego, while users would have to continue leasing their installed terminals or purchase new equipment from another supplier.

Either of these options probably would be more expensive than buying the installed equipment, ICA said. Moreover, it added, if AT&T Information Systems offered its rental customers credits toward the purchase of new PBXs, telephones, modems, and/or data terminals made by Western Electric, the company could gain an unfair competitive advantage.

To get around these problems, the ICA suggested that the FCC "impose an interim price freeze before implementation of the detariffing plan." This would "allow [AT&T Information Systems] to formulate a ... plan to ... sell substantially all multiline [customer premises equipment] during 1984. The key to a successful detariffing plan is to allow all users, residential and business alike, to purchase their embedded [equipment] from the very beginning of the implementation of the plan."

The user group maintained that the FCC "must be careful to set up the appropriate safeguards to prevent the transaction costs ... from being anything more than minimal, [and] business users need, at a minimum, the same amount of time as residential users to prepare for the full deregulation of all embedded [customer premises equipment]."

What You Can Buy on Jan. 1

AT&T initially promised that users of the following customer premise equipment would be able to buy their installed equipment beginning next Jan. 1:

- ***Telephone sets:*** The Models 500 and 2500; multibutton electronic telephone sets.
- ***Voice terminals:*** Com Key, Touch-A-Matic 32 Automatic Dialer, Speakerphone, Comm-Stor, Voice Paging.
- ***Data communications equipment:*** Series 100, 200 and 300 modems; Dataphone II.
- ***Data terminal equipment:*** Dataspeed 40, printers, Model 43 teleprinter, Dataspeed 4540, Model 1000 teleprinter.
- ***Teleconferencing equipment.***

Some other items have since been added to the list. Notable among them are the Dimension and Horizon communications systems, including all associated feature packages, and Type 556 and 557 cord boards.

"Other embedded electromechanical equipment will be offered for sale by Jan. 1, 1986 or earlier, as conditions for viable sales plans are achieved," the Federal Communications Commission was told earlier this month by AT&T Information Systems, Inc., AT&T's deregulated terminal marketing subsidiary formerly known as American Bell, Inc.

Beginning in the fourth quarter of 1984, AT&T Information Systems also will offer users of 1A Key sets the option of buying them, provided the equipment is located behind private branch exchange or ESSX/Centrex switching systems. "This category accounts for approximately 50% of the 1A Key equipment in place," the company said.

The remaining "Key-as-main" equipment "will be offered for sale as experience is gained with the 'Key-behind' systems and as [AT&T Information Systems] gains the ability to handle in-place sales operations." In any event, Key-as-main equipment will become ready for sale no later than Jan. 1, 1986.

Now you can buy, lease or rent Digital's new Rainbow 100 personal computer from MTI.

The new Digital LA50. 100 cps in draft mode, 50 cps in memo mode. Multiple fonts. Bit-map graphics – perfect for the personal computer.

We are authorized distributors of Digital's terminals, printers and personal computers.

In addition to offering you rental and leasing opportunities, MTI's experienced personnel will train you on your equipment either in MTI's classroom, or at your company. And we carry the software packages you need. Database management, electronic spreadsheets, word processing and much more.

We also have a professionally-staffed service department and an extensive parts inventory, so that we can have your equipment up and running within one day of your call. And for those who want to save the expense of a service call, we offer depot service.

MTI is one of the few Authorized Digital Terminals Distributors, so we can give you the best of two worlds; terminals, based on advanced technology from the industry leader, and the expertise and service from applications specialists.

Whether you buy, rent or lease our equipment, you'll find MTI is the one source for all the terminals, peripherals, systems, applications expertise and service you'll ever need. At good prices. Call us today.

New York: 516/621-6200, 212/767-0677, 518/449-5959
Outside N.Y.S.: 800/645-6530
New Jersey: 201/227-5552
Ohio: 216/464-6688

mti systems corp. AUTHORIZED DIGITAL TERMINALS DISTRIBUTOR

Applications Specialists & Distributors, New York, New Jersey and Ohio. DEC, Intel, Lear Siegler, Texas Instruments, Dataproducts, Diablo, 3Com, Hazeltine, Racal-Vadic, Digital Engineering, MICOM, Cipher, U.S.Design, Protocol Computers, MicroPro, Microsoft, Polygon and Select.

Kin of Man Killed by Robot Awarded $10 Million

By Paul Gillin
CW Staff

DETROIT — A Wayne County Circuit Court jury last week awarded $10 million to the family of a Ford Motor Co. worker who was killed by a robot.

The decision against Unit Handling Systems, a division of Litton Industries, Inc., was the result of the Jan. 25, 1979, death of Robert Williams, a core stacking operator at Ford's Flat Rock, Mich., casting plant. Williams was struck in the head by a one-ton transfer robot while retrieving a part from the Deep Lane Storage System made by Litton.

The plaintiffs claimed that the system lacked a logical procedure for locking the robots out of the area in which the man was working, that the robot was not equipped with appropriate warning signals and that the Litton operations manual failed to include adequate safety instructions for human intervention in the automated process.

Paul Rosen, an attorney for the plaintiffs, also charged that the warning system on the Litton robot did not meet American Standards Association codes.

A Litton spokesman denied the charges. "In all of these installations, there is appropriate signage and instruction to operators, and the first rule is to shut down the system. The man ignored the safety instruction," spokesman Robert Knapp said.

Knapp said Litton has not decided whether it will appeal the verdict.

Concern Builds as Strike Continues Against Bell

By Tom Henkel
CW Staff

Mounting concern about the future was the prevalent feeling last week of both AT&T supervisors and telecommunications users as AT&T headed toward the second week of a walkout by the 650,000-member Communications Workers of America Union.

Foremen and supervisory personnel have been able to keep the highly automated Bell system running in spite of the walkout. However, the strike is delaying user installation and expansion plans, and some users are worried the skeleton force of managers now running the AT&T telephone network may get bogged down if the strike continues.

With 97% of the AT&T system computer-controlled and "in excellent repair," it has not been difficult to keep the system working, an AT&T spokesman said. If problems do develop, supervisors have been trained to make the necessary repairs.

Many AT&T supervisors worked their way up through the ranks, pointed out Don Mathis, a spokesman for Southern Bell (one of AT&T's operating companies), so the firm is not short on expertise. But there is a shortage of the manpower necessary to carry out the normal duties of the striking workers.

Conrad Pologe, a division manager for AT&T in New York, said the truncated AT&T work force will probably not be able to handle new installations until the strike is over. For data processing customers, that means requests for new lines will probably be put on hold for the duration of the strike.

Preferential Treatment

Pologe added that data communications customers are not going to get preferential treatment over regular telephone customers.

At this point, the AT&T operating companies responsible for line maintenance and installations are giving top priority to emergency organizations, such as hospitals, police and fire stations. Next in line is the maintenance of existing lines. New installations are at the bottom of the priority list.

While Pologe did not say it was impossible to have new lines installed — at least in the New York area — it is highly unlikely that many new installations will be completed until the strike is over.

"Repair is going to be a problem," admitted Pologe, who said so far there have been no major line problems to disrupt service. A spokesman for AT&T Communications (formerly the Long Lines Division) said the 6,747 managers in that division are trying to fill about 21,200 jobs. With each manager trying to juggle about four jobs, a string of major problems could severely impact long-distance communications, he said.

One user said last week that "at this point," the AT&T managers' "performance has been excellent." James A. Weiss, manager of data communications at Miami-based Eastern Airlines, noted the airline's existing network has been working well, but added that his main concern is whether the strike will restrict expansion plans at Eastern.

Eastern has been installing about 150 new circuits a month. Even when the strike is over, there may be a delay in getting back on schedule.

The strike is also putting service bureaus in a difficult position. Although several major service bureaus contacted last week reported only minor problems, they pointed out that they cannot bring new customers on-line.

At press time last week, little progress had been made in resolving the strike.

CW Photo by P. Gillin

Electrical workers struck against AT&T in sympathy with the Communications Workers of America. They are shown here picketing outside phone company offices in Framingham, Mass.

Are you managing your hardware or is your hardware managing you?

Use ABR™ Archive and Superscratch

Automatic archiving of data sets. ABR, performing the ARCHIVE function, will backup, scratch, and uncatalog any data set that has not been referenced for a user-determined time period. Users can also request archiving of their data sets by control statements or remote queue. ABR will record these data sets in the ARCHIVE control file. Inactive data sets can be archived, freeing the disk space for more productive use.

FDR™ - Automatic Backup & Recovery ...The Fastest DASD Management System

Available for IBM OS/VS & MVS
90 Day Free Trial

INNOVATION DATA PROCESSING
970 Clifton Ave., Clifton, NJ 07013 • 201—777-1940

U.S. to Ask Prison Term For Man Guilty of Sending Components to Soviet Bloc

By Peter Bartolik
CW Staff

ALEXANDRIA, Va. — The U.S. government will ask a federal court judge next month to impose a prison sentence on a businessman for illegally shipping embargoed electronic components to Soviet bloc countries.

Geunther Nachtrab, 43, of nearby Falls Church, Va., is now free on bail after being found guilty last month of nine counts of violating the Export Administration Act and regulations and one count of conspiring to violate the act.

Nachtrab faces a maximum sentence of 50 years in prison and a fine of $460,000 for shipping components valued at $40,000.

Contacted last week, Assistant U.S. Attorney Thomas Buchanan did not specify what sentence he would ask for. Sentencing is scheduled for Sept. 2.

Two Austrians and one West German still face prosecution in the same case. Buchanan said he will seek extradition to the U.S. or ask that they be prosecuted by their native authorities. However, the most he expects is that Klaus Taller, the West German, may be prosecuted by West German authorities.

Nachtrab and the others were indicted in April after former employees of Nachtrab informed U.S. Department of Commerce officials that embargoed goods had been shipped to East European countries.

Multiple Overseas Shipments

During a five-day trial that concluded with five hours of jury deliberations, the goverment presented proof that during the period of January to February 1982, Nachtrab made three overseas shipments of National Semiconductor Corp. integrated circuits; two shipments of Hewlett-Packard Co. diodes; one shipment of Motorola, Inc. transistors; and three shipments of integrated circuits manufactured by Advanced Micro Devices, Inc.

According to Buchanan, the Commerce Department had determined that all the components had dual military and civilian uses.

Nachtrab operated a company that he represented to vendors variously as TEE, Text Editing Equipment and The Electrical Exchange, Buchanan said, adding that he believes the firm was never formally incorporated. It was charged he bought components from vendors saying he was to use them at a nonexistent West Virginia manufacturing facility and in a contract with the Central Intelligence Agency.

Smuggled Through Austrian Firm

The goods, according to the government, were smuggled to Hungary through the Austrian firm of Steuerungstechnik and Messgeraete, which was owned and operated by the two Austrians, Anna Landau and her daughter, Jeanette Wellems. Some of the items were first shipped to Taller's West German firm, Contacta, to escape detection, the government charged.

Although Nachtrab based his defense on a claim of ignorance of illegality, Buchanan presented evidence that Nachtrab, in fact, had extensive experience with export regulations, both as owner of his own firm and previously as export accounts manager with a Virginia firm.

The two employees also testified that Nachtrab had a copy of the export regulations and that telephone calls were received from Landau in Hungary.

Another Strong Year

WASHINGTON, D.C. — Nearing the completion of its second year, the U.S. Customs Operation Exodus program has about doubled the statistics it compiled during its first year and is rapidly approaching a total interception of $100 million of illegal or unlicensed exports.

The program was formed almost two years ago to intercept goods being shipped overseas to Eastern bloc countries in violation of the Export Control Act.

Between Oct. 1, 1981, and June 30, 1983, the project made 1,785 seizures of improperly licensed or otherwise illegal export materials valued at $99,203,845 being shipped overseas, according to customs spokeswoman Chris Fraze. Customs agents accounted for 1,417 of those seizures valued at $99,046,078, with the balance credited to the U.S. Department of Commerce, Fraze said, adding that the statistics include violation of the Arms Export Control Act.

At the end of its first year, Operation Exodus was credited with a total of 765 seizures [CW, Nov. 22].

Out of those seizures, 217 cases were accepted for prosecution by the U.S. Department of Justice during the last 21 months, according to Fraze, resulting in 192 indictments and 222 arrests; 155 convictions have been handed down in federal courts.

DATA GENERAL INTRODUCES THE DESKTOP GENERATION.

One of Several Post-Settlement Rulings

AT&T Not to Pay Handling Expenses: Greene

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — U.S. Federal District Court Judge Harold Greene decided earlier this month that "station-handling expenses" should not be transferred from the Bell operating companies to AT&T. Greene made that decision despite objections from several modem manufacturers that it would have "a decided negative impact on local telephone rates and competition."

Station-handling expenses include the costs of installing and testing telephones, data terminals and other customer premises equipment, such as terminals. An estimated $5 billion is involved.

The modem makers — through their trade association, the Independent Data Communications Manufacturers Association (IDCMA) — had contended that station expenses can be determined precisely through "sampling of Bell operating companies' records, selected cost studies or other methods." However, Greene said in his recent order that AT&T has persuaded him "there is no practical way to separate out the various handling costs."

The judge's comment was part of an order disposing of a number of requests for further changes in AT&T's plan of reorganization, which is a result of the U.S. vs. AT&T antitrust case settlement. At the same time, Greene gave final approval to the reorganization plan accepted earlier this month by AT&T [CW, Aug. 8].

In the course of ruling on the proposals for additional changes, Greene:

- Refused to change his mind about the assignment of inside wiring. It will remain with the Bell operating companies because "to assign such wiring to AT&T would be to insert AT&T-controlled facilities between the operating companies and the subscribers, and such an assignment would be entirely inconsistent with the basic purposes of the [antitrust case settlement]."
- Ruled that AT&T will not have to license its computer software to the Bell operating companies on a royalty-free basis. Reason: The operating companies did not help finance development of this software. (But the operating companies have been granted free licenses and sublicensing rights to all AT&T patents and related technical information developed with their financial assistance by Bell Laboratories, Inc. and Western Electric.)
- Told the Bell operating companies they can market customer premises equipment and directory advertising outside their service areas.

It's the only desktop to give you the world of data processing, integrated office automation, technical and industrial automation and personal automation. All in one box.

THE WIDEST RANGE OF SOFTWARE.

The DESKTOP GENERATION™ runs one of the widest ranges of software available on any desktop.

It's the only desktop to accept the most popular micro-based operating systems (CP/M-86, MS/DOS) as well as Data General's three advanced operating systems.

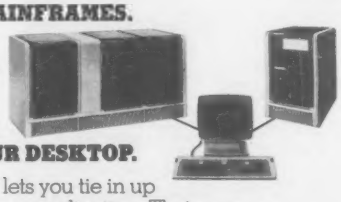
It's the only desktop to give you all the benefits of CEO™ office automation in one box: a "personal" computer that provides electronic mail, electronic filing, electronic calendaring, and word processing.

The DESKTOP GENERATION allows you to run such operations as drafting, project management or analysis as a technical/scientific workstation.

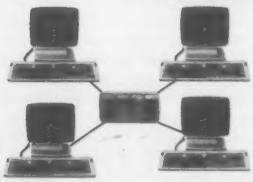
And it can provide your small business with the data and information processing power you need to help your company grow.

TIES IN WITH SUPERMINIS AND MAINFRAMES.

The DESKTOP GENERATION not only ties in with every Data General 16-bit and 32-bit machine. It also protects your investment by tying in with IBM and industry-standard networks.



RUNS UP TO 4 TERMINALS FROM YOUR DESKTOP.



The DESKTOP GENERATION lets you tie in up to 4 terminals, depending on your application. That means you can customize your computer network to your needs.

And you can add on such peripherals as printers and graphic plotters. Its memory can be expanded up to 2 megabytes, its storage up to 30MB (that's equivalent to 700 Wall Street Journal pages).

THE WIDEST RANGE OF SERVICE OPTIONS.

The DESKTOP GENERATION is the only desktop to offer 16–count 'em, 16–service plans, giving you the widest range of choices to fit your budget and usage needs.

And one of the few desktops to offer an online, dial-in software information service.

CALL NOW.

To get more information on the phenomenal Data General DESKTOP GENERATION, you only have to call this toll-free number: **1-800-554-4343, Operator C1.**

Or send us this coupon today:

CEO and DESKTOP GENERATION are trademarks of Data General Corporation. CP/M-86 and MS/DOS are registered trademarks of Digital Research Inc. and Microsoft Corp., respectively. Copyright 1983, © Data General Corporation, Westboro, MA

Data General, M.S. 600, 4400 Computer Drive, Westboro, MA 01580.

Please send me more information on the DESKTOP GENERATION.
I'm interested in:
☐ Industrial Automation ☐ Office Automation ☐ Small Business Systems
☐ Distributed Data Processing ☐ Design and Drafting
☐ Engineering Analysis ☐ Computer-Aided Manufacturing

Name_____ Title_____
Company_____ Telephone_____
Address_____
City_____ State_____ Zip_____

Data General. a Generation ahead.

AT&T Offshoots Announce Name

WASHINGTON, D.C. — The last of the seven regional phone companies created by the AT&T antitrust case settlement announced its official name last week. The Pacific Telesis Group (Pactel) will encompass the Pacific and Nevada Bell Telephone companies.

The other six regionals and the operating companies they own are:

- U.S. West: the Northwestern, Mountain and Pacific Northwest Bell Telephone Companies.
- Southwestern Bell Corp.: Southwestern Bell Telephone Co.
- Bell South: Southern, Southeastern Bell Telephone Companies.
- Bell Atlantic: Pennsylvania, Diamond State, Chesapeake and Potomac and New Jersey Bell Telephone Companies.
- New York New England Telephone Co. (Nynex): New York, New England Telephone Companies.
- American Information Technology (Ameritech): Illinois, Indiana, Michigan, Ohio and Wisconsin Bell Telephone Companies.

SIM to Sponsor Info Conference

HOUSTON — The Society for Information Management (SIM) will sponsor the Fourth International Conference on Information Management here on Dec. 15-17 at the Houstonian Hotel & Club.

Held in cooperation with the Association for Computing Machinery, the conference will feature 26 papers presented in the technical sessions by authors from both academe and the industry. The papers will address topics such as natural language query, software development, end-user computing, management of the information systems organization and federal systems and policies.

Featured speaker at this year's conference dinner will be Gerald R. Wagner, president of Execucom Systems Corp.

More information about the conference can be obtained from Maryam Alavi at the Department of Systems and Strategy, College of Business Administration, University of Houston, Houston, Texas 77004.

IBM's LADT Petition Stirs Opposition, Support

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — IBM's petition asking the Federal Communications Commission (FCC) to declare Local Area Data Transport (LADT) an enhanced offering [CW, July 11] has provoked spirited opposition recently from the Bell operating companies and strong support from their competitors.

LADT is a new network accessing scheme that enables a conventional analog local loop to support a second, digital data circuit that has a transmission rate of up to 4,800 bit/sec.

LADT employs a black box at the subscriber's end of the local loop, which the Bell operating companies maintain is a multiplexer, but which their competitors contend is customer premises equipment.

According to the FCC's Second Computer Inquiry Decision, customer premises equipment — terminal equipment — and enhanced services can be offered by AT&T or a Bell operating company only through a separated subsidiary on a nontariffed basis.

Bell's competitors favor this approach because it reduces the chance of surreptitious cross subsidies between the regulated and nonregulated arms of AT&T.

The Bell operating companies pointed out in their recent answer to IBM's complaint that "the commission has specifically found that multiplexing equipment used to deliver multiple channels to a customer is not customer premises equipment."

However, the Independent Data Communications Manufacturers Association (IDCMA), which represents several major modem manufacturers, said in a recent statement to the FCC that Bell system technical manuals are "replete with references to the NCTE [network channel terminating equipment] that AT&T regards as 'integral' to LADT." NCTE is one type of wideband channel interface that the FCC, in a recent decision [CW, June 20], explicitly classified as customer premises equipment.

Largely because of these technical references, IDCMA concluded that the terminating LADT device is customer premises equipment, and the offering must, therefore, be marketed through a separate subsidiary.

Second Bone of Contention

The second major bone of contention is whether LADT performs protocol conversion. If it does, it is an enhanced offering, according to the FCC decision.

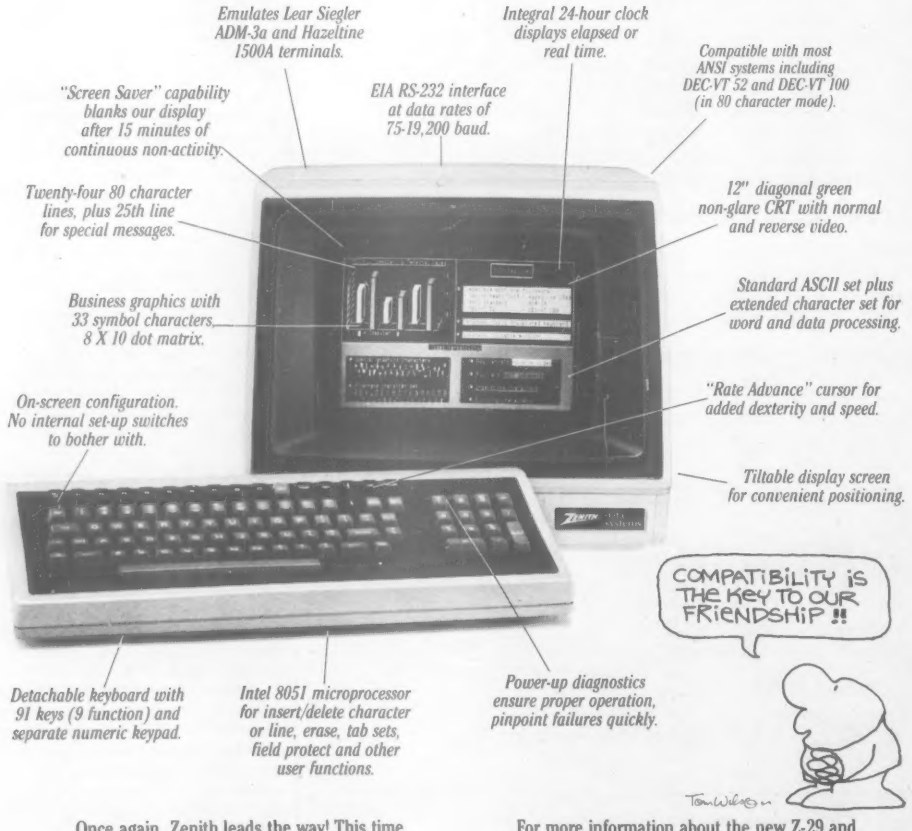
LADT employs either a two- or three-level protocol. IBM said it is three levels, maintaining that one level is added by the Bell operating companies and, therefore, LADT includes protocol conversion.

The Bell operating companies said the third layer performs only intranetwork functions, is stripped off at the exit node and, therefore, satisfies the FCC requirement that any messages transmitted by a Bell operating company must employ the same protocol on the I/O links.

GTE Telenet Corp. said LADT access circuits should be tariffed separately from end-to-end LADT service so that non-Bell carriers could employ them. The underlying technology appears to be applicable to "a wide variety of data communications services," the company added.

The Association of Data Processing Service Organizations, Inc., which represents the nation's major computer service bureaus, thought the commission should "issue a definitive interpretation of the [Second Computer Inquiry Decision's] rules ... Such an approach would be the most effective way of addressing the many issues relating to protocol conversion that are likely to proliferate as new services are introduced."

Meet the compatible, affordable Zenith Z-29.



Once again, Zenith leads the way! This time with one of the most versatile, yet affordable, video terminals ever produced: the Zenith Z-29.

Not to keep such a talented terminal all to ourselves, we've made it compatible with most existing systems. It can handle just about any software application. And it's priced to meet even the most demanding budgets.

Behind every Zenith product is our regionalized distribution network. This assures you the best in service and support, as well as the fastest possible delivery.

For more information about the new Z-29 and our complete line of video terminals, desktop computer systems, monitors, peripherals and software, see your nearby Zenith Data Systems distributor. Or call (800) 323-5924. In Illinois, call collect (312) 391-8861.

ZENITH | data systems

The quality goes in before the name goes on.

© 1983 Universal Press Syndicate

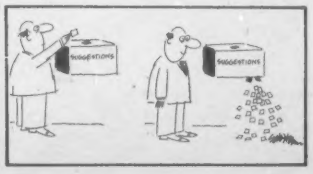
Pair to Receive DPMA Award

PARK RIDGE, Ill. — Paul M. Pair, said to be the founder of the first privately owned data processing school in the U.S., has been selected as the 1983 recipient of the Distinguished Information Sciences Award from the Data Processing Management Association (DPMA). The announcement was made by DPMA International President J. Crawford Turner.

Presentation of the award to Pair will be made Nov. 2 during the DPMA's International Conference and Business Exposition in Baltimore.

Pair, 85, founded in 1957 the first accredited private DP school, the Automation Institute of Chicago. The school was purchased by Control Data Corp. in 1968; Pair continues to serve as its senior education consultant.

Pair was director of two business schools in Chicago before founding the Pair School of Business in 1952 and the Automation Institute five years later. He has served on various association boards.



Expected in November

AT&T's Cellular Radio Nears Commercial Use

By Katherine Hafner
CW Staff

CHICAGO — The nation's first commercial cellular radio system is expected to be operational here in November.

The cellular system, which will be operated by AT&T's Advanced Mobile Phone Service (Amps), has completed its final phase of testing. It now awaits "the last pieces of the regulatory puzzle" before it is made commercially available, according to Katie Harriss, an AT&T spokeswoman.

Hailed as "the mobile telephone of the future," cellular radio works by means of a series of cells, each containing its own low power transmitter and computer controller [CW, May 30].

Unlike existing mobile telephone networks, where a channel can handle only one call at a time, separate cells allow a number of calls to be handled simultaneously in the same frequency band.

As the signal weakens in one cell, it is picked up by a transmitter in the next cell without interrupting the signal.

"Engineering-wise, the system is operational," Harriss said. "Now we're waiting for our covering license from the Federal Communications Commission and an Illinois state Certificate of Public Convenience and Necessity. After that, we file a tariff, and then we can go into service."

According to Harriss, Amps in Chicago has a healthy lead on other U.S. cities planning cellular radio systems. Los Angeles and Miami are expected to be the next two cities to go into service, but Harriss does not expect them to be operational before mid-1984.

The Chicago system will cover the entire metropolitan area, with 17 individual cells encompassing about 2,500 square miles, Harriss said. The market for cellular radio, which has been hailed as the mobile telephone of the future, ranges from "chief executive officers to sales representatives . . . or anyone on the road," she added.

But cellular radio is a technology that does not come cheaply. The Chicago system, which will eventually handle some 100,000 users, will cost $50/mo for each line. During peak usage hours — from 7 a.m. to 7 p.m. Monday through Friday — calls will be 40 cent/min; off-peak calls will cost 24 cent/min.

The equipment for the system will be supplied by OKI Advanced Communications of Hackensack, N.J., which will carry the Amps brand name, and Motorola, Inc. Sales and rental, phone service subscription and number assignments will be handled by Chicago Communications Service, Inc. and Chicago Mobile Telephone Co., both of Chicago, and Metrocom of Schaumburg, Ill.

Newsletter Out On System/36

MAITLAND, Fla. — Scope Publications, Inc. has announced its latest newsletter, "Scope/36," for users of the IBM System/36.

Published monthly beginning in September, the newsletter reportedly will focus on all areas of the System/36. Features for experienced programmers will include a program of the month, tips and techniques for OCL, RPG II and utilities, as well as technical discussions of all facets of the computer.

Also offered will be operating hints for the nonprofessional and a Contact column where readers can get in touch with each other. This service is available at no charge to subscribers offering or requesting software.

Subscriptions cost $59 anually. A sample copy of "Scope/36" can be obtained from Scope Publications, which can be reached through P.O. Box 1252, Maitland, Fla. 32751.

Aid for Disabled Subject of Meet

MINNEAPOLIS — A national conference sponsored by the University of Wisconsin on the use of computers to help disabled people will be held at the Leamington Hotel here Sept. 12-14.

"Discovery '83: Computers for the Disabled," will feature a blend of vocational rehabilitation and special education.

It will provide teachers, administrators, counselors, government personnel, researchers, computer technologists and disabled persons with an opportunity to learn of advances in computer technology relating to the disabled, conference sponsors said.

The conference registration fee is $175.

Further information is available from the Office of Continuing Education, University of Wisconsin-Stout, Menomonie, Wis. 54751.

■ BDS / Dataproducts Plug-Compatible Printers
■ Built for Handling Continuous High-Volume Output

IBM · DEC · HP
BURROUGHS
BDS

■ Since 1975, the Largest Independent Supplier of Plug-Compatible Printer Systems
■ Over 5,000 Systems Installed
■ Complete Line of High Quality Daisy Wheel, Matrix and Band Printers. 55 CPS to 2000 LPM
■ 30-50% Savings
■ Quick Delivery (30 Days or Less)
■ Reliability Built-In (BDS Controllers and Interfaces)
■ Low Maintenance Cost
■ TRW Nationwide Service
■ Price Includes Installation and 90 Days Parts and Labor Warranty

I would like more information on plug-compatible printers
☐ 55 CPS Daisy Wheel Printer
☐ 80-300 CPS Matrix Printer
☐ 300-2000 LPM Band Printers

Name_____
Title_____
Company_____
Address_____
City_____ State_____ Zip_____
Phone (_____) _____

(415) 326-2115

BDS Corporation
1170 Crane Street
Menlo Park, CA 94025

U.K. (734) 736025 Australia (03) 241-8901

Hot Summer a Sign of Success for Forecasters

By Tom Henkel
CW Staff

WASHINGTON, D.C. — While many have cursed the record-breaking heat which has plagued much of the U.S. this summer, government weather-watchers are happy because they predicted it. Their success in summer weather prediction followed a so-so record of forecasting for the winter months.

The computer-generated 90-day forecasts of temperature and precipitation activity in the U.S. have been highly accurate for the spring and summer, according to Robert Libezey, research coordinator for the Prediction Board of the Climate Analysis Center of the National Meteorological Center here.

Predictions for August, September and October show a 50% chance that the eastern third of the U.S. will continue to have above-normal temperatures. That does not, however, mean the heat wave is going to continue.

Furthermore, the Pacific Northwest and Southern California will also experience above-normal temperatures, and the mid-continent states, Northern Plains states, Great Lakes region and New England regions will experience below-average temperatures, according to Libezey.

The Southeast is expected to experience above-normal temperatures through October, added Bob Dickson, a meteorologist with the National Meteorological Center.

Checking the Forecast

Libezey is currently gearing up to compare this summer's computer-generated summer forecast, made in late May, with actual temperature and precipitation data for the season. Barring a dramatic drop in temperature and increase in precipitation, the summer forecast will be accurate, he said.

While Libezey noted that current forecasting methods make it impossible to predict extremes, such as a record-breaking heat wave, the center's spring and summer forecasts have been right on target — that is, if you consider broad statements like: "above normal" and "below normal" to be indications of pinpoint accuracy. According to Libezey, the past two quarters have represented better than past predictions.

What has happened to make the forecasts more accurate? Libezey is quick to admit he does not know. It may be that years of researching weather patterns and fine tuning of computer models is finally paying off. It could also be dumb luck.

Every three months, the center uses North American Air Defense IBM 360/195 processors to run seasonal models to predict weather trends for the next 90 days. While the process remains fairly constant, the models used for each season are somewhat different. Therefore, a few good seasons (in the statistical sense) do not necessarily mean the center has improved its models. In fact, it can take years to determine whether model changes have an impact on their accuracy, Libezey said.

Who Does It Benefit?

How does the 90-day forecast help the average American? Well, it doesn't. Libezey said the long-range forecasts are not the kind of things people can use to plan a picnic or vacation. The forecasts only predict the average temperature and precipitation for a three-month period. In other words, it could snow on the day of your family reunion, even thqugh the long-range forecast might call for above-normal temperatures.

Where the long-range forecasts come in handy are for people involved in seasonal businesses. For example, a firm that ships coal could use the quarterly forecasts to determine how much coal to ship for the winter months.

Basking in the glory of a good six-month track record, the center will wait another week before making its 90-day fall forecast.

Common Schedules Fall '83 Conference

PHOENIX — Common, an IBM user group representing over 2,200 worldwide installations with machines ranging from the Personal Computer to the 4300 series of mainframes, will hold its Fall '83 conference here on Oct. 22-26 at the Phoenix Hilton Hotel.

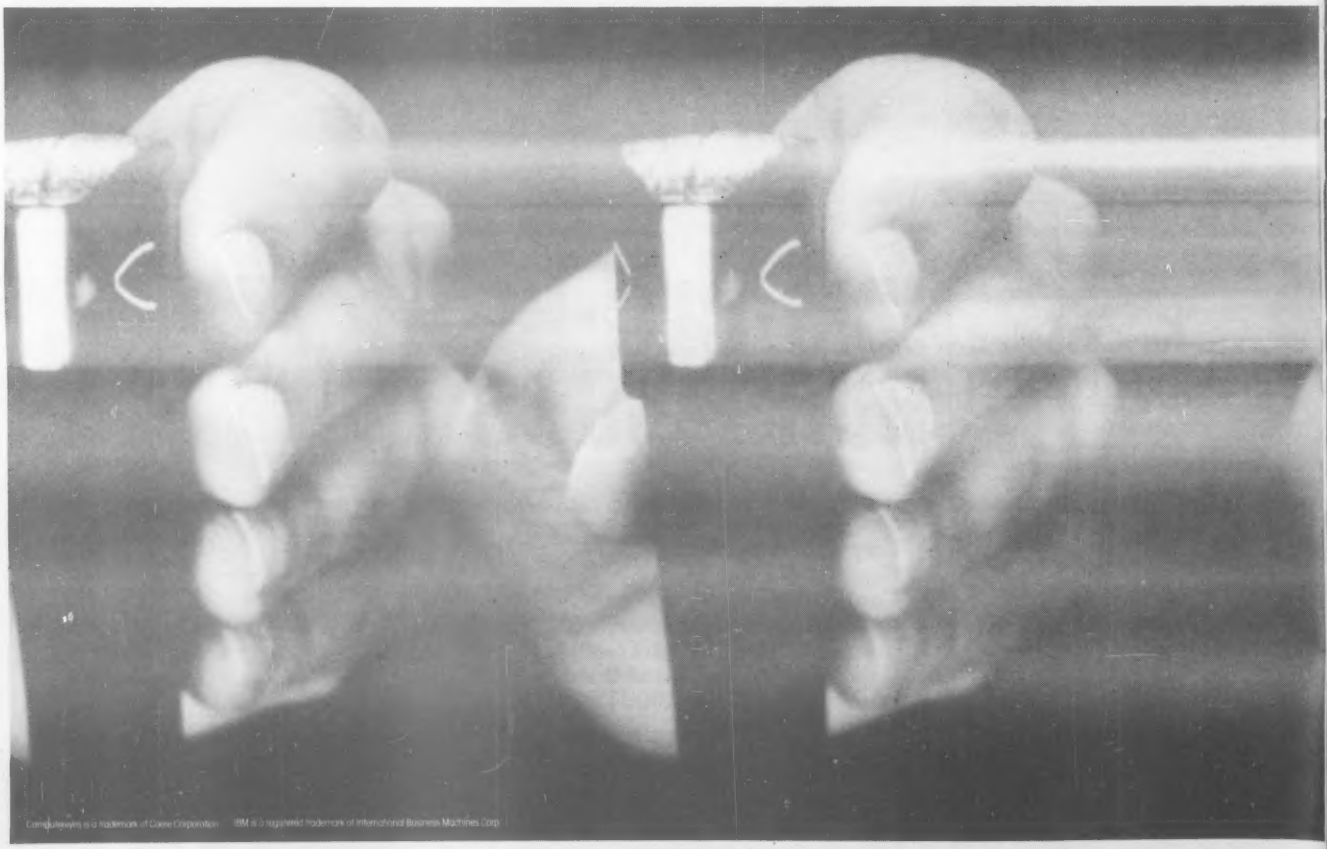
The four-day conference will offer 170 sessions featuring speakers from both the user community and IBM discussing the latest data processing trends in systems, applications and management, according to conference officials.

Besides 4300 and Personal Computer users, users of the System/3, System/34, System/36, System/38, 5280, 1130, 1800, 5100 series, 5520, Series/1, Datamaster and Displaywriter will also be represented at the conference.

Along with the above seminars, a series of sessions developed in conjunction with Northwestern University that deal with professional development will be conducted.

The price of the conference for Common members registering before Oct. 10 is $100; after that date, the cost is $130 for members. For nonmembers, the registration fee is $160 until Oct. 10 and $180 to register after that.

Additional information on the user group meeting is available from Common, located at Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.



Job Calls for Interpretive Skills

Exec Credits Success to People-Blending Skills

By Katherine Hafner
CW Staff

ELMWOOD PARK, N.J. — James L. Zahner not only knows where his talents lie, he knows how to use them in his climb up the corporate ladder.

The recently named corporate senior vice-president in charge of management information systems (MIS) and logistics for the Grand Union Co. has never doubted that his strength is in "blending together technical people, who often have difficulty communicating with management, and management, who have difficulty working with technical people."

Zahner thinks his job is similar to that of directing a stage play. "It's like bringing actors together and creating a finished product that's enjoyable for everyone," the 53-year-old Zahner explained in a recent interview.

This is not to say that Zahner knows nothing of computers. On the contrary, he has been working with computers since their beginnings.

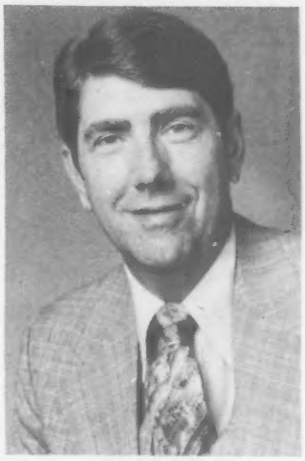
Zahner got his start in the field as a high-school student, when he worked summers at Diebold, Inc. in Ohio as an operator of IBM tabulating machines. He received his undergraduate degree in business with a major in accounting from Miami University at Oxford, Ohio, in 1952 and went on to receive a master's in accounting from Ohio State University.

When Zahner finished graduate school, he turned down a job offer from IBM to work for the Glidden Co. in Cleveland as a field auditor. When he was transferred to Glidden's Durkee food division in 1958, he oversaw the installation of the company's first computer.

Best as 'Catalyst'

In subsequent jobs, where he undertook similar responsibilities, Zahner came to recognize that he was best at acting as a "catalyst and a manager," leaving the technical expertise to others. "I couldn't write a program if my life depended on it," Zahner commented. "I always knew I wanted to do some sort of management."

As Zahner sees it, the job of a DP manager means interpreting the needs of a business and determining the tools needed to manage it. So successful was Zahner at doing this that when Grand Union Co. acquired Atlanta-based Colonial Stores, Inc., Zahner got an assignment in England to help a sister chain, Allied Suppliers Ltd., do a "bit of grass roots retraining." As vice-president of management information, Zahner helped the chain of 900 supermarkets throughout England and Scotland install entirely new IBM equipment and integrate the entire



James L. Zahner

computer services division with the rest of the company.

In June of this year, Zahner returned from England, and 24 hours later he assumed his new post in Elmwood Park. Grand Union Co. employs 31,000 people and operates 610 stores in 15 states and the Virgin Islands.

"This job is a bit different from the others I've held," Zahner said. "The vice-president of MIS reports to me, and so does the vice-president of warehousing and distribution. So I'm spread a bit wider with the responsibility for tying our company's warehouse and transportation operation together with computer services."

It all "makes sense," Zahner said, considering the grocery retail business of receiving and planning orders, getting them into the warehouse at the right time, purchasing and delivering stock to stores and accounting for its sale.

Zahner expects to remain detached from the actual equipment and "whether it's working well at midnight. I have very capable people who free me up to be planning ahead to determine our needs."

Because the job was created recently and Zahner is the first to fill it, much of what he does depends on his own creativity, while he believes strongly in remaining accountable to the chairman of the board.

"You can suggest a computer solution to a problem, but half the time you can see that a computer solution isn't necessarily the best way to handle the problem," Zahner said. "In many cases there's a good pencil or commonsense solution. You don't get that flavor if the top computer person isn't reporting to the top corporate level.

"If DP is done well and if those of us in it have a broad enough education, then we can manage the job correctly," Zahner said.

COMPUTEREYES.™

Now you can give your computer eyes. Eyes for faster, more accurate data input without using a keyboard.

Computereyes is the error-reducing high-speed input peripheral for entering data. From order entry to accounting to the factory floor to shipping & receiving.

It electronically reads data and enters it into practically any host computer and terminal system with one sweep across human-readable OCR-A alphanumeric characters. At up to 200 characters per second.

Computereyes comes in both hand-held wand readers and desktop slot readers, complete with standard parallel or RS-232C serial interfaces, and as a single-board IBM PC enhancement.

To find out more, call or write for our color brochure. Caere Corporation, 100 Cooper Court, Los Gatos, CA 95030, (408) 395-7000. TWX No. 910-597-5391.

Computereyes. The peripheral with vision.

THE WORLD LEADER IN EYE-TECHNOLOGY.

CAERE CORPORATION

After Two Uneventful Years

Mini User Reports Same Strange Problems

By Peter Bartolik
CW Staff

PITTSBURGH, Pa. — After two successful years using Wang Laboratories, Inc.'s word processing equipment, a division of Westinghouse Electric Corp. here recently experienced some strange problems.

For example, the VS 100 system the firm purchased late last year has "been losing some data, and it has been going down quite a bit," said Diane Lee, manager of Specialized Office Services (SOS) at Westinghouse's Gateway Center complex here.

Adding a 1M-byte memory board to that system was also more trouble than expected. It was ordered this January but, as Lee explained, it "was several months before the board got here."

Shortage of Boards to Blame?

Tom Hayes, Wang's account representative in Pittsburgh, agreed that his company "slipped up a little on delivery," blaming the problem on a shortage of boards "at that particular time." However, he claimed that Westinghouse shared responsibility for the delays because an internal reorganization stalled approval of a purchase order that also included a conversion from rental to ownership.

Gateway Center encompasses a number of Westinghouse's operating companies, including Power Systems, Public Systems, Industry Products, corporate staff, a broadcasting subsidiary and international and credit operations. About 1,000 of Westinghouse's 140,000 employees work here.

Lee was a member of the task force that selected Wang equipment more than two years ago for the firm and later replaced it with another Wang system because her department expanded.

"We have consistently been able to improve productivity and provide more effective services through computerization," she said recently.

For its second Wang system, installed late last year, Westinghouse selected the Wang VS 100 combined processing unit.

The system has been modified since installation and now has 2M bytes of memory, two 300M-byte Control Data Corp. disk drives and one 75M-byte Wang disk drive. It includes 46 workstations, 14 printers — reduced from 19 with the acquisition of two Wang laser printers — and a Xerox Corp. 5700 printer that is interfaced with software produced by LBM Software Co. of New York.

While satisfied "overall" with the system and what it has accomplished, some problems have "caused more downtime than I would like," Lee said.

Downtime problems were directly attributable to the "overloading" of the system on just 1M byte of memory, Wang's Hayes said.

The new board was delivered several weeks ago and, he claimed, remaining problems have been resolved by recently upgrading the operating system to Wang's Version 5.30.

Lee agreed "partially" with Hayes' observation on the purchase order. She conceded that paperwork was delayed, but added that three shipment dates were missed after the purchase order was finally processed.

Representatives of Wang's distribution division were not available to comment directly on the delay, but spokesman Rich Schulman said from corporate headquarters in Lowell, Mass., that the problem was attributed to a breakdown in communications, complicated by the large number of orders from various Westinghouse divisions, and was an isolated incident.

Problem of Lost Data

Stressing that she is content to resolve outstanding issues "one-on-one" with Wang, Lee nonetheless observed that "we are still having some problems. When the system went down, Lee said, data was lost from documents on which personnel were working at the many on-line terminals.

"We lost some data when it was backing up; it gave us some prompts it was doing it properly and it wasn't," she added. With the newly installed operating system version, "I'd like to believe that's not going to happen again."

Other than the memory board and downtime problems, Lee said the experience with Wang has been mainly positive.

In 1979, management decided that office operations needed some upgrading. A volunteer task force of 30 secretaries from the Power Systems and Industry Products companies analyzed operations on three floors of the headquarters building. Problems in both time and space utilization were discovered.

"Some secretaries were overburdened while others were bored," recalled Lee. "But with the help of computerization, we were able to create a whole new concept in office services."

Lee's department has established three centers on three floors of the Gateway Center and has 400 users. SOS processes more than 15,000 pages of copy monthly.

Word processing, dictation, telecommunications and filing functions have all been scrutinized to eliminate duplication and improve efficiency.

IMS VERSUS CICS
DO YOU KNOW THE DIFFERENCES?

Once, it was enough to know only CICS or only IMS. Today, the on-line world is expanding so that you can no longer afford not to know the capabilities of both.

The Educational Services Division of **R. L. Roper Consultants, Inc.** now offers a comprehensive course to give you the critical information you need to compare these products and understand how each can work for you.

IMS VERSUS CICS: A DETAILED COMPARISON
This four-day seminar provides concise and practical information regarding technical and functional differences between IMS and CICS. Among the topics covered will be:

- Transaction Management/Flow
- Backup/Recovery
- Data Security/Integrity
- File/Database Management
- Migration (Conversion) Considerations
- Applications Coding Differences
- IMS/CICS Workshop

Seminars will be offered in New York City starting October 3. Or we can arrange on-site presentations. Send the coupon below for more details, or you can call Donna Hodges at (212) 697-1162.

ATTENTION MANAGERS: Two-day seminar, with emphasis on the decision-maker's perspective, also available. Check the box on the coupon for further information.

R.L. Roper Consultants, Inc.
Suite 800
122 East 42nd Street
New York, New York 10168

Please send me additional information about:

☐ IMS VERSUS CICS: A DETAILED COMPARISON
☐ IMS VERSUS CICS: A MANAGEMENT PERSPECTIVE

Present on-line systems:
☐ IMS/VS ☐ CICS/VS ☐ OTHER _____

Name _____ Title _____

Address _____

City _____ State _____ ZIP _____

Estrin Named Chairwoman Of Infocom '84

HOLMDEL, N.J. — Judith L. Estrin, vice-president of engineering at Bridge Communications, Inc., has been appointed general conference chairwoman of Infocom '84, a conference sponsored by the Institute of Electrical and Electronics Engineers. John W. Wong, associate professor of computer science at Canada's University of Waterloo, has been selected as technical program chairman.

The Infocom conference will be held April 9-12 at the Cathedral Hill Hotel in San Francisco.

Estrin holds a BS degree in mathematics and computer science from the University of California at Los Angeles and an MSEE degree in computer engineering from Stanford University. She is the founder of Bridge Communications, an active member of the IEEE 802 committee on network standards and the author of several papers on local networks.

Wong holds a Ph.D. degree in computer science and worked at the IBM Zurich Research Laboratory from 1981 to 1982 while on sabbatical from the University of Waterloo. His research interests include modeling and analysis of computer systems, computer networks and communications protocols.

Announcing the Encore™ diskette.

The way it performs, you'd never guess it costs only $1.59.

Here's your best value in diskettes today.

New Encore meets the same high standards that big-name brands meet – 100% error-free performance, ANSI certification. In many cases it actually exceeds system requirements. There's even a 1-year replacement guarantee.

Yet the cost is as low as $1.59 for single-sided, single-density 5¼" Encore diskettes (when you purchase four or more boxes, ten diskettes per box).

And only $2.99 for double-sided, double-density 5¼" Encore diskettes.

With important savings comes reliable performance on all popular systems: Apple II, IIPlus, IIe, III; IBM PC; Radio Shack TRS-80; DEC; Wangwriter and many others. So from now on, get accurate, reliable performance without the high cost. Get Encore.

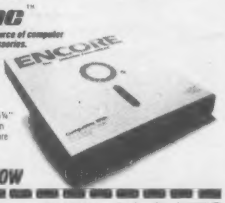
Send coupon today. Or call
1 (800) 547-5444.
In California 1 (800) 547-5447.

To ensure your complete satisfaction, Encore diskettes are covered by a 45-day risk-free trial period. Allow two weeks for delivery. This offer good only in the Continental U.S. Call for information on system compatibility.

FREE Inmac Floppy Library Case!

Order your Encore diskettes within the next 30 days, and with each box you'll receive a free Floppy Library Case for easy storage, fast retrieval, and sure protection of your data. But hurry – supplies are limited. (Limit 4 per order)

inmac™
World's leading source of computer supplies and accessories.



*Price for one SSSD 5¼" Encore diskette when purchasing 40 or more diskettes.

ORDER NOW

Inmac, Encore Introductory Offer, 2465 Augustine Dr., Santa Clara, CA 95051
Yes, I think Encore sounds like a great deal. Please send me:

No. of boxes	Order No.	Description	Price per box of 10 diskettes: 1	2-3	4+
_____	7970	5¼" SSSD soft sector	$25.90 (2.59 ea)	$19.90 (1.99 ea)	$15.90 (1.59 ea)
_____	7971	5¼" DSDD soft sector	$43.90 (4.39 ea)	$35.90 (3.59 ea)	$29.90 (2.99 ea)
_____	7960	8" SSDD soft sector	$39.90 (3.99 ea)	$29.90 (2.99 ea)	$26.90 (2.69 ea)
_____	7961	8" SSSD soft sector IBM format 2305830	$32.90 (3.29 ea)	$24.90 (2.49 ea)	$19.90 (1.99 ea)

Subtotal _____
Customers in CA, CO, DC, NJ, NY, TX, IL, GA add applicable tax. Sales Tax _____
Total Order _____

☐ Check enclosed ☐ Bill Company P.O. No. _____
☐ Visa ☐ MasterCard Account No. _____

Signature _____
Name _____ Phone _____
Firm _____
Address _____
City _____ State _____ Zip _____
☐ Please send me a free Inmac catalog. 112108

The flight deck layout for the Boeing 767 airliner is a far cry from the dial-cluttered cockpits of yesteryear. Two central CRTs provide readouts from the flight management computer system. The pilots can call up engine information on the keyboards immediately below.

Airborne Automation on Boeing 757, 767 Takes Over Flying, Landing, Making Pilot 'a True Manager'

By Paul Gillin
CW Staff

MIAMI — When the Wright Brothers landed their motorized box kite at Kitty Hawk, N.C., 80 years ago, they never imagined that task and thousands more would one day be presided over by a machine.

But computer technology on the new Boeing Co. 757 and 767 aircraft has made the manual functions of flying and landing an airplane virtually obsolete. If he desires, a pilot now needs only to get the craft airborne. Once aloft, computer circuitry can take over, flying the plane to its destination at the optimum speed, landing and approaching the terminal without human intervention.

In other words, automation has made the pilot "a true manager," a Delta Air Lines spokesman observed.

The bewildering array of dials and meters that once filled the cockpit has given way on the new planes to a comparatively uncluttered display centered around CRT screens that provide readouts of nearly any information short of the in-flight meal's menu. At the heart of the Flight Management System developed by Boeing is the Flight Management Computer (FMC), which carries out flight planning and navigation and monitors conditions aboard the aircraft.

Built-in test equipment on the Boeing 767 has reduced maintenance to an average of one maintenance man-hour per hour of flight, Boeing claims.

The FMC's navigation data base can store an airline's entire route structure. If the weather ahead looks bumpy, the pilot can call up the flight's progress along the flight plan and key in changes on an alphanumeric keyboard. An alternate flight plan including holding patterns can be stored along with cost profiles that show the effects of air speed on fuel consumption.

If desired, the pilot can set the plane to fly itself in the most fuel-efficient mode. The computer will maintain the ideal speed, adjusting automatically to compensate for environmental conditions.

The flight deck also features a monitoring system that consolidates over 40 mechanical dials into a single-screen display. The Engine Indication and Crew Alerting System (Eicas) continuously displays flight information needed for normal operation on one CRT. It also monitors over 400 inputs from engines and subsystems and signals an alert if a problem is detected.

Other CRT displays include the Attitude Director Indicator and Horizontal Situation Indicator, which present in a single-color display the attitude and position information that once filled a bank of meters. The Horizontal Situation Indicator integrates compass, track, weather and map references into a single display; it also incorporates color weather radar similar to that used by many television stations.

Despite the aircraft's price tag of about $40 million each, Boeing has already sold more than 300 of the 757s and 767s. A Delta spokesman said the extra expense of the high-tech hardware will be made up through increased efficiency.

Delta airlines has proceeded with its plan to purchase 42 of the 767s. "It was a pretty tough decision, but increased efficiency, economy of operation and overall performance of the fleet will make that cost burden of buying the new equipment justified in the long run," Delta spokesman Bill Berry said.

He added that "the cost [of the 767] is higher than the [larger Lockheed Corp.] L-1011, but our experience shows that the airplane is slightly more than 30% more efficient to operate than the [Boeing] 727, which was the closest thing in size." If planned purchases are completed, 767s will eventually comprise nearly 20% of Delta's fleet.

'Pilots Love It'

"The pilots love it," Berry said. "They love the rapid ease of reading information, and they are relieved of the burden of doing the very menial tasks. [The computer system] frees them to give more consideration to the safe performance of the airplane, not tie them down with some of the computations that were required."

Airline mechanics, too, have gained from the new technology, Berry noted. Built-in test equipment on the aircraft detects, isolates and verifies equipment failures. Most of the flight deck components are modular and can be replaced without the need for retest.

Boeing claims the test equipment is capable of isolating a fault on the first attempt at least 95% of the time and that an average of one maintenance man-hour per hour of flight is required.

International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

BRAZIL

SAO PAULO — Brazil's Secretary of Industry and Commerce, Camilo Pena, voiced his support for nationally controlled joint technology ventures when he spoke recently at the country's First National Congress of Industrial Automation. During the same event, however, Danilo Venturine, the special secretary for land-related subjects and general secretary of the National Security Council, took issue with Pena. "Our doors cannot be closed to foreign cooperation," Venturine said.

JAPAN

YAMATO — The joint venture company of Fujitsu Ltd. and Matsushita Electric Corp., called Panafacom Ltd., is doubling the production of its personal computer. The PFC-280 was introduced last April to compete with the IBM 5550 Personal Computer and can function as a Japanese word processor, as a terminal linked to a host system and as a stand-alone personal computer. A Panafacom spokesman said the production increase reflects an intention to keep up with IBM in terms of sales volume and market share.

YOKOHAMA — Matsushita Communication Industrial Co., Ltd. has introduced equipment that reportedly recognizes an individual's speech in several different languages, including Japanese, English, German and French. The product is called Panavoice JH-600 and costs approximately $600.

TOKYO — The Nippon Computer Graphics Association was recently established here to coordinate research and development efforts in the field of graphics technology. Dr. Isamu Yamashita, chairman of the Mitsui Engineering and Shipbuilding Co. Ltd., was named chairman of the new association.

TOKYO — Magicsoft Japan Co. Ltd. has been established here as a 100%-owned subsidiary of Magicsoft U.S.A. The firm manufactures business software as well as game software. Robert Sauer, president of the Japanese company, anticipates first-year revenues of $3 million.

TOKYO — Hitachi Ltd. said it has become aware of 64K-byte dynamic random-access memories (RAM) masquerading under the Hitachi trademark in the UK marketplace. Hitachi discovered the fake RAMs when they were rejected by a number of customers who said the RAMs failed to work properly and were causing significant operating problems. The fake RAMs are easy to distinguish from real Hitachi products because the pins are silver-plated instead of solder-dipped, and they do not bear the twin-mould-ejector marks of the Hitachi devices, the vendor said.

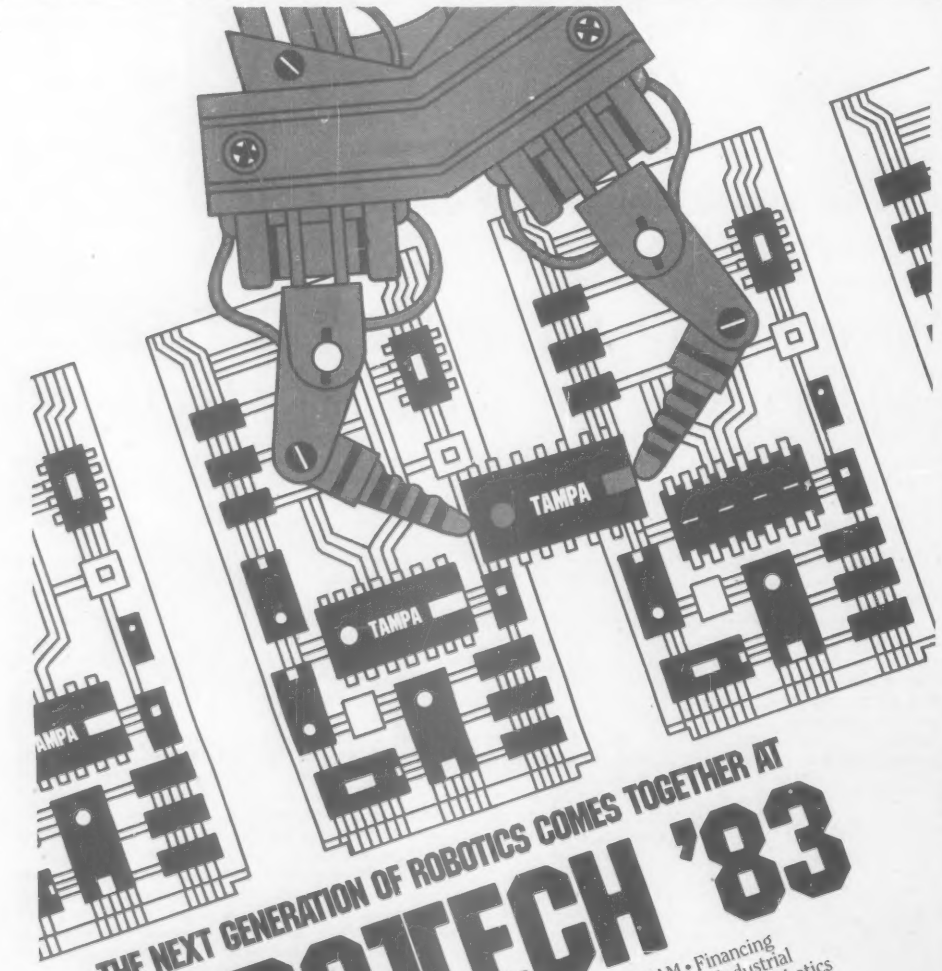
SWEDEN

STOCKHOLM — Gadelius A.B. has been selling robots to an unlikely customer: Japan, the world's foremost robot manufacturer. So far, 30 robots, valued at roughly $1.5 million, have been sold to Japan since the end of last year. The Swedish robots, which cost about $128,000 each, are multipurpose machines, as opposed to the Japanese single-task robots, and handle a variety of difficult tasks, including wielding a 138 lb. tool accurately into position within half a millimeter. Gadelius is planning to build a factory in the city of Kobe, Japan.

STOCKHOLM — Mats Gabrielsson, managing director of Datatronic, one of Sweden's leading software companies, announced plans to move the company's main operations to the U.S. to protest a government proposal to impose new, stiff taxes on profits. Gabrielsson predicted that other Swedish companies will follow Datatronic's lead if the government goes through with the tax plan.

WEST GERMANY

MUNICH — Mainframe vendor Siemens AG recently announced "XA Capable" processors that claim to perform above the IBM 4300 series. The processors are made by Japan's Fujitsu Ltd. and modified by Siemens for the German market. The Models 7860 E, L and R are aimed at IBM's 3083 low-end machines, with main memory capacities of 4M to 32M bytes. They are equipped with up to 16 communications channels.



THE NEXT GENERATION OF ROBOTICS COMES TOGETHER AT

ROBOTECH '83

The next generation of automation is here. Robotech 83 is the first to bring it together at a major international conference and exposition. Specifically, Robotech 83 will focus on practical applications and implementation of: • Precision Robotics • Sensory Systems • Automated Assembly • Artificial Intelligence • CAD/CAM • Financing Automation • International Industrial Automation Imports & Exports • Robotics in Agriculture

WHEN: October 2-5, 1983.
WHERE: Tampa, Florida; U.S.A. Curtis Hixon Convention Center

Call or write for more information today. It could help you compete more effectively tomorrow. Contact Stephen A. Michelini, One City Hall Plaza, 8E, Tampa, FL 33602, U.S.A. (813) 223-8401. Telex: 522613.

Staring at CRT Distorts Color Perception: Trio

By Katherine Hafner
CW Staff

EVANSTON, Ill. — Stare at anything long enough and you're bound to go cross-eyed.

But stare at a CRT for hours on end and your color perception will be knocked out of whack.

This is what an architect, a physician and a psychologist here discovered by chance. After looking at a CRT screen for an extended period of time, white figures on a black background take on a pink hue. Depending on how long you stare at the CRT screen, this effect can last as long as several weeks.

Known in psychological circles as the McCollough effect, this harmless by-product of CRT use was noticed recently by Susan Greenwald, an architect using an IBM Personal Computer for word processing. She asked her husband Mark, an ophthalmologist, about it.

Mark Greenwald called a friend who happens to be a psychologist specializing in visual perception, and he unraveled the mystery.

"I routinely explain the McCollough effect in my lecture courses," said Randolph Blake, a professor of psychology at Northwestern University here. "The conditions under which the effect is produced have to be fairly constrained. But it just so happens that the green letters on the black terminal generate just this aftereffect.

"The most interesting thing is that the pattern of the color distortion conforms to the pattern and contour of the letters on the screen. That is, if you stare for a long time at a CRT, then see white letters on a black background that are of similar size and shape, you'll get the pinkish tint."

The effect is far from vivid, Blake explained, and can last anywhere from several minutes to several weeks.

"There aren't really a lot of instances where we read white letters on black," Blake conceded, "but sometimes company brochures and words on a book jacket have it."

Blake said that although the effect is physiologically harmless, it is important that physicians be aware of it in case they receive calls from worried patients.

Law Firm Establishes DP Group

BOSTON — A law firm here has established within it a group specializing in legal issues involving computers and other high-technology areas.

Brown, Rudnick, Freed & Gesmer's new Computer and High Technology Law Group will concentrate on legal questions involving computers, software programs and data bases and pertinent questions in related technologies such as bioengineering, cryogenics, lasers, robots, medical engineering and fiber optics.

Roy N. Freed, author of the 1960 article "A Lawyer's Guide Through the Computer Maze" and *Computers and Law, A Reference Work*, has been brought in to head the new group, according to the announcement by senior partner Matthew Brown. A graduate of Yale University and Yale Law School, Freed is a founder, director and past president of the Computer Law Association; a member of the Association for Computing Machinery; and a member of the American Bar Association's Section of Science of Technology.

COMTEN SERIES 7164
4800 BPS

NCR COMTEN'S NEW MODEMS INSTALL AS EASY AS 1, 2. NO NEED FOR 3.

Take a new Comten 7160 Series modem from the shipping carton, and put it right to work in your network. NCR Comten, the recognized specialist in data communications systems, designed it for easy installation right on site.

Mount these modems in standard EIA 19-inch racks, or stack them up on level surfaces; determine configuration: plug in the power cords, connect the modems to the line—and they're ready to go.

Fast installation plus SNA compatibility and built-in diagnostics mean improved uptime. In sum, NCR Comten modems can make networking considerably more convenient than ever before.

NOT ONLY INSTALLABLE, BUT FIXABLE.

You can not only install these diagnostic modems yourself, but repair them with your own staff—everything's accessible through the user-friendly front panel and repairable right down to board level.

Or NCR Comten can deliver the service, with the range and speed that *only* a company with NCR's resources can give you, anywhere in the world.

Comten 7160 modems are built like tanks—sturdy and reliable, with rugged pc boards, switches and knobs. All at a price that makes choosing even easier.

Easy to install. Easy to service. Outstanding in terms of reliability, performance and price. Let us prove it. Call or write NCR Comten, Inc., Dept. 8015, 2700 Snelling Ave. N., St. Paul, MN 55113. (612) 638-7390.

NCR
NCR Comten, Inc.

Managers on the Move

ROBERT J. KOHLSTEDT has been promoted to vice-president of management information systems (MIS) at Interstate United Corp. in Chicago. He will be responsible for all of the company's data processing activities, including systems development, programming and computer operations.

Previously, Kohlstedt was director of MIS at the Chicago-based national food services management company.

Before joining Interstate United in 1980, Kohlstedt was director of information systems for Union Special Corp. in Chicago.

Kohlstedt attended Northwestern University and the University of Chicago, where he received a certificate in advanced management.

***

JAMES R. STEELE has joined Harte-Hanks Communications, Inc. as manager of its corporate data center in San Antonio, Texas.

Steele went to Harte-Hanks from Bendix Corp., where he was operations manager of the corporate data center in Ann Arbor, Mich., for 2½ years. He has more than 12 years of data processing experience.

Steele holds a bachelor's degree in management from Oakland University and has done graduate work toward a master of business administration degree at Eastern Michigan University.

(Continued on Page 21)

Robert J. Kohlstedt

Cullinet Sets User Weeks This Fall

WESTWOOD, Mass. — Schedules and formats for its annual Domestic and International User Weeks were recently announced by Cullinet Software, Inc.

The Domestic User Week will take place in New Orleans Oct. 2-6. The International User Week will be held Nov. 6-10 in Monte Carlo, Monaco.

Events will focus on education and information exchange through courses, enhancement sessions, special interest discussions, user presentations and informal workshops. Also featured will be The Demonstration Center, demonstrations of various Cullinet products. Keynote speakers will be named later, a spokesman said.

Cost of the conferences will be $400. Information is available from Cullinet Software, 400 Blue Hill Drive, Westwood, Mass. 02090.

Marietta Schedules Users Meet

PORTLAND, Ore. — A semiannual users group meeting has been scheduled here for Aug. 31 to Sept. 2 by Martin Marietta Data Systems, Inc., a division of Martin Marietta Corp.

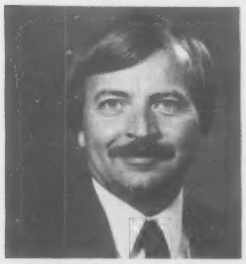
The keynote speaker will be Tom Gunn, manager of Arthur D. Little, Inc.'s Computer Integrated Manufacturing Group. Gunn will address emerging manufacturing technology and its impact on manufacturing in the future.

Plant tours have been scheduled at Tektronix, Inc. and Electro-Scientific Industries, two users of Martin Marietta's MAS-Manufacturing software product.

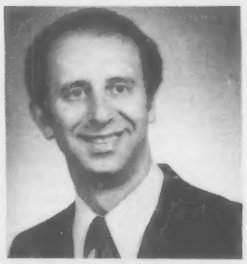
Registration is free to MAS users and includes plant tours, exchange sessions, conference materials, breakfast and lunch with guest speakers and a buffet social.

Additional information can be obtained from Martin Marietta Data Systems, Marketing Services, located at 6303 Ivy Lane, Greenbelt, Md. 20770.

Managers on the Move



James R. Steele



Allan D. Breyer

(Continued from Page 20)

ALLAN D. BREYER has been elected to the newly created position of first vice-president of First Federal of Michigan. He will manage the firm's MIS department.

Breyer was previously a vice-president and acting controller and manager of computer systems for First Federal.

Breyer has been an employee of First Federal since 1964. He is a 1962 graduate of Lawrence Institute of Technology in Southfield, Mich.

***

DENNIS CREIGHTON has joined Zurich American Insurance Co. as manager of data services support in Schaumburg, Ill. He will be responsible for all data processing hardware and software.

Prior to joining Zurich American, Creighton was manager of software support for Brunswick Corp. for four years.

He also served as senior systems programmer for two years with Wilson Sporting Goods.

***

MICHAEL N. HOFMAN has been named director of management information services for French Hospital Medical Center in San Francisco. He will provide leadership in the selection and development of a data processing system for the rapidly growing health plan and outpatient department.

Before joining French Hospital, Hofman was director of information systems at Mercy Medical Center in Denver.

Hofman received his M.S. in health administration from the University of Colorado.

***

JOHN A. BARNARD has been named manager of systems and programming for the MIS division at General Development Corp. in Miami. In his new position, Barnard will direct 21 people in MIS systems development.

Prior to his promotion, Barnard was General Development's supervisor of systems and programming in MIS.

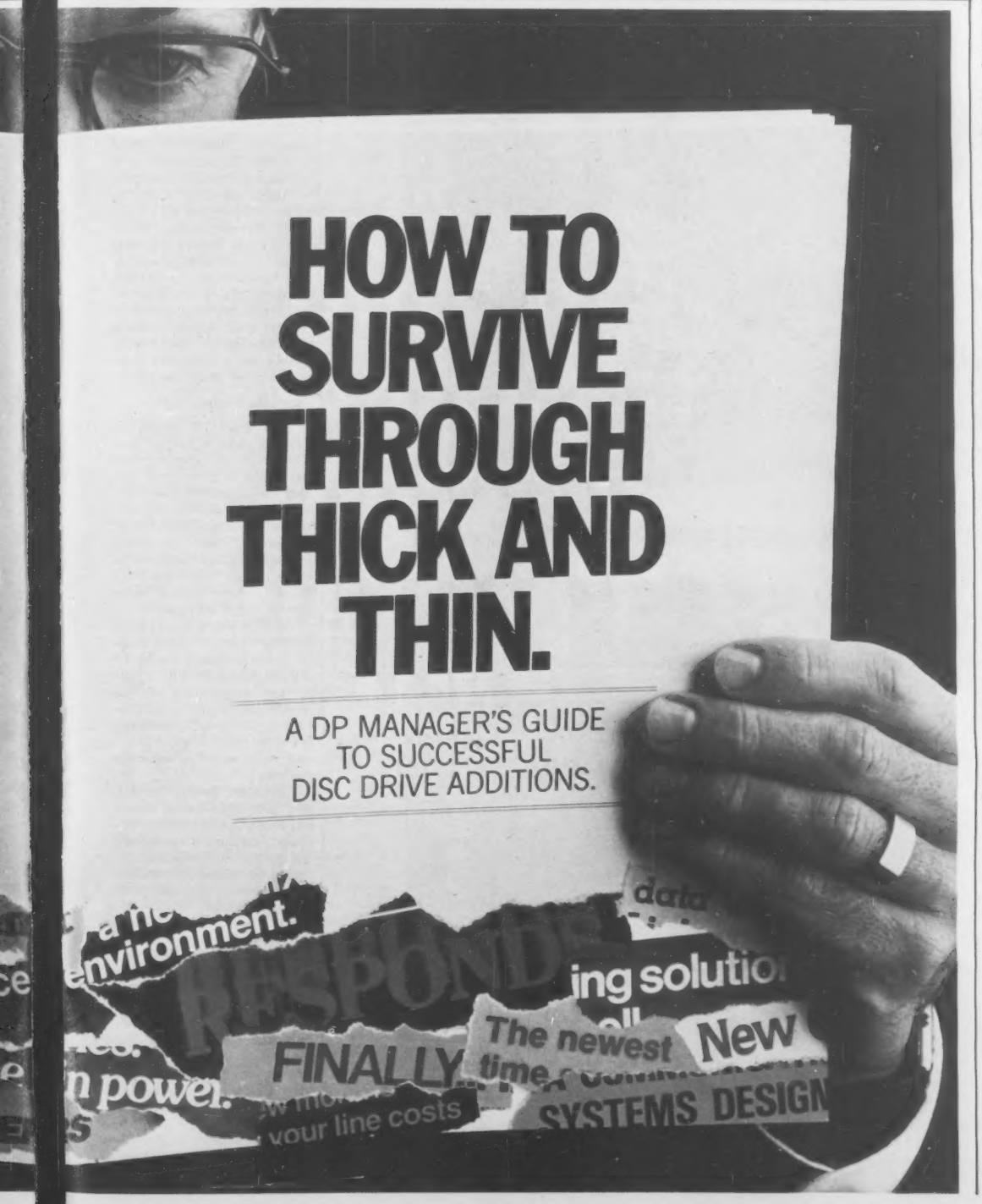
Barnard attended the University of Miami and has completed a number of courses in programming, project control and systems development at Florida Technical College and Florida International University.

***

PAUL L. CARSON has been promoted to vice-president of management information services for Parker Hannifin Corp. in Cleveland. In his new position, Carson is responsible for companywide information systems development and processing.

Previously, he was corporate director of management information systems for Parker Hannifin, a supplier of components for fluid systems in industrial, automotive, aviation, space and marine markets.

Carson holds a bachelor's degree from Cleveland State University and a master's degree from Case Western Reserve University.



Mini Models New Plants' Environmental Impact

FORT WORTH, Texas — For Bud Chaffin, obtaining permit approvals for plant expansions or construction of new facilities used to mean an exhaustive ordeal of preparing and processing required environmental information. His job has been made much easier thanks to a minicomputer that can prepare environmental report data from models.

Chaffin is coordinator of environmental technical services at Champlin Petroleum Co. here. In addition to preparing detailed environmental impact reports, Chaffin is required by the Environmental Protection Agency (EPA) to build numerous atmospheric dispersion models. The models are detailed, simulated predictions of the pollutants that would or could be emitted from a plant and their projected concentrations and motion through the atmosphere.

Before installing a minicomputer to handle the simulations, Chaffin said he had two ways of getting the EPA data. He could rely on his company's IBM mainframes and DP personnel for the simulations; or he could hire an outside consulting service to process the models and prepare the reports and related graphics. Chaffin said both methods were time-consuming, error-prone and very expensive.

"Relying on in-house personnel or an outside source for information processing were both very frustrating because there was no real control, no sense of urgency and no first-hand familiarity with the problem at hand or its criteria," Chaffin recalled.

Early in 1981, Chaffin decided to look for his own system to process the EPA-mandated models. This, he concluded, would give his staff hands-on control of their DP operations. It also would give the department immediate editing and revision capabilities.

At the same time, Champlin Petroleum had decided outside consultant costs, additional company DP expenses and the associated expenses attributed to delays and errors were too high. Chaffin said the firm felt the price of using a consultant or using in-house DP personnel far out-weighed the cost of a stand-alone system.

Chaffin chose a system developed by Form & Substance Corp. of Westlake Village, Calif., which consists of a 16-bit Naked Mini 4/95 minicomputer from Computer Automation, Inc. The processor is equipped with 128K bytes of random-access memory, a video display terminal with three-dimensional graphics capabilities for developing effective visual interpretations of the models, a printer and floppy or hard disk storage of up to 40M bytes and a complete software library of EPA models.

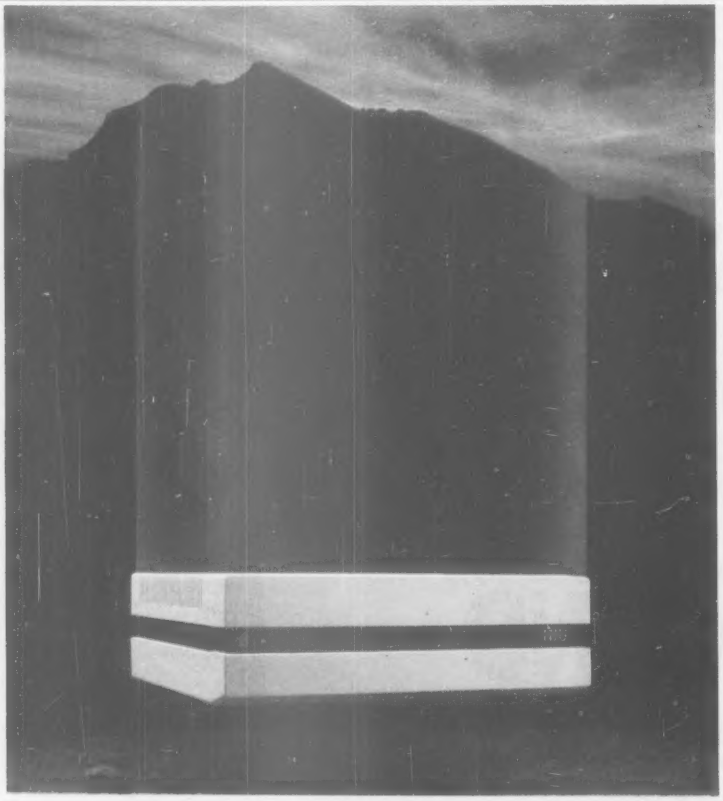
As Design Tool

In addition to preparing EPA models, Chaffin said Champlin Petroleum uses the Form & Substance system, called the IM-1, as a design tool for simulating and predicting concentrations of pollutants at proposed plants. By using those findings, design engineers can build environmental safeguards into their plans.

An EPA siting report for a proposed plant or plant modifications requires up to 15 different EPA models, Chaffin said, depending on the terrain, prevailing wind conditions, kinds of pollutants being generated by a plant and many other measurable factors.

Champlin Petroleum has also been able to cut down on construction delays because Chaffin's department can get reports for permit approval processed in a matter of days, rather than weeks or months, he said.

Form & Substance is continuing to add new capabilities to its system. For example, a toxic spill and disaster program was recently developed for use in chemical processing plants. It pinpoints chemical spills, charts the concentration levels of pollutants and their effects on the environment and also provides instructions for evacuation and cleanup. Form & Substance is now positioning itself as a total environmental systems company, Chaffin said.



Now, a major advancement in Net/One local area networking. Lower cost.

Our new VLSI chip set has allowed us to do with one printed circuit board what we used to do in three. The result is a new Network Interface Unit, the NIU 150, that's half the cost of its predecessor, the NIU-1. In areas where a smaller number of either broadband or baseband connections are required, the pared-down NIU 150 brings per-port connection costs well below $500.

Streamlined NIU 150's mean more flexibility, too, by serving small equipment clusters in more diverse locations at a lower cost.

Like our other Network Interface Units, the new NIU 150 is equipped, off the shelf, to support most industry-standard equipment interfaces. And like our other NIU's it comes with complete network services software. It's also programmable, so special interface protocols can be added now or anytime in the future to support special equipment.

The broadband version of our new NIU 150 has an integral modem. Both baseband and broadband NIU 150's can accommodate up to six ports for device attachment.

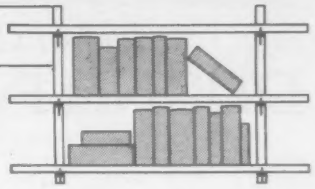
Give us a call, or write for more information about turning the equipment you have now—whatever it is—into the network you need now, at a lower cost than was possible before.

Ungermann-Bass, Inc., 2560 Mission College Boulevard, Santa Clara, California 95050. Telephone (408) 496-0111.

Net/One from Ungermann-Bass

© 1983 Ungermann-Bass, Inc.
Net/One is a registered trademark of Ungermann-Bass.

Off the Press



MANAGING THE DATA BASE ENVIRONMENT
By James Martin

Yet another James Martin book enters the DP world this summer, this one ably encompassing the administration, design, application and end use of data bases. As customary, the author fills the pages with boxed-off real problems as told by real people up and down the DP ladder. At times this style disrupts the narrative, but mostly the real voices constantly remind the reader that Martin's accumulated wisdom on the data base environment grows out of listening to the problems.

Some Martin wisdom:

"Data base use is the key to flexible employment of companies and their transmission networks."

"Management needs to understand that data base systems have a long-term payoff."

"Because it is impossible to predict what information a top executive might need, the information generated by lower-level management should be made accessible, preferably via on-line systems, but should not be dumped on the executive's desk."

"One of the most important current developments in data base technology is the growth of high-level languages for data base users."

Hardcover, 766 pages, $49.95, ISBN 0-13-550582-8. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

MICROPROCESSOR SUPPORT CHIPS: THEORY, DESIGN AND APPLICATIONS
By T.J. Byers

The subject matter can easily be overlooked; in fact, for most people there is no overwhelming reason to learn about 100 microprocessor support chips. This little bit of hardware simply relieves the microprocessor of more mundane work and does it outside the view of most managers.

But this book lures the reader with large diagrams, attractive typeface and a well-structured format. Byers takes time to explain concepts tangential to the chips themselves. The sum of seven chapters on local-area network controllers for Ethernet tells as much about the network as about the controllers. The section on Winchester disk controller chip sets is laced with interesting asides, such as one explaining the origin of the name.

The book is aimed at systems designers who need a handy reference on support chips. Each chip is described on facing pages — text and pinout on one, the schematic on the other.

Hardcover, 224 pages, $38, ISBN 0-07-009518-3. Micro Text Publications, Inc./McGraw-Hill Book Co., 1221 Ave. of the Americas, New York, N.Y. 10020.

NEEDED: PROFESSIONAL MANAGEMENT IN DATA PROCESSING
By John J. Callahan

DP managers traditionally rise through the technical ranks and consider the management of technology their primary job responsibility. As for professional management — most say they don't have the time to study it.

And so, the author claims, DP departments are run by the Authoritarian, Militarist, Perfectionist, Politician or Technocrat. These management types lead as best they can, but their best is no longer good enough for data processing, Callahan says. What is needed is a promotional system that identifies those individuals who possess the character traits necessary to manage and not simply the skills to do their current job.

There are no revelations here about positive management traits (fairness, intelligence and so forth) or negatives (coldness, arrogance, selfishness). Callahan suggests use of graphologists, psychologists, trial projects, long-term observation and character trait tests to uncover management abilities in employees. He lampoons the corporate sacred cow — the performance evaluation — as an outdated tool claiming objectivity, which actually is a subjective measurement governed by the mood, attitude and style of the judging manager.

Hardcover, 206 pages, $25, ISBN 0-13-610956-X. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

Books of Note

TUTORIAL ON SOFTWARE MAINTENANCE, edited by Girish Parikh and Nicholas Zvegintzov. *359 pages, ISBN 0-8186-0002-0. IEEE Computer Society Press, Suite 300, 1109 Spring St., Silver Spring, Md. 20910.*

TELECOMMUNICATIONS REGULATION TODAY AND TOMORROW, edited by Eli M. Noam. *450 pages, ISBN 0-15-004294-9. Law & Business, Inc./Harcourt Brace Jovanovich, Publishers, 757 Third Ave., New York, N.Y. 10017.*

THE RISE OF THE COMPUTER STATE, by David Burnham. *273 pages, $17.95, ISBN 0-394-51437-8. Random House, 201 E. 50th St., New York, N.Y. 10022.*

Nielsen cable network product usage survey NHI Sept '82. Subject to qualifications, available upon request.

THE ESPN AUDIENCE HAS 40% MORE COMPUTER BUYERS. YOU'LL BE IN THE CHIPS.

ESPN's audience buys more computer hardware and software compared to the U.S. average. 56% more ESPN viewing households own video games. 33% more own home computers. And 40% more of ESPN's adult male viewers are responsible for the purchase of business computer systems.

ESPN REPLACES NETWORK UNDERDELIVERY IN BASIC AND PAY TV HH

	TOTAL	TOTAL U.S.		CABLE		PAY CABLE	
	COST $(M)	GRP	INDEX	GRP	INDEX	GRP	INDEX
NETWORK SPORTS SCHEDULE (6 SPORTS ANNOUNCEMENTS)	2500	32.3	100	26.8	83	27.3	85
NETWORK + ESPN (5 NETWORK SPORTS & ESPN ANNOUNCEMENTS)	2500	30.1	93	34.8	108	42.3	131

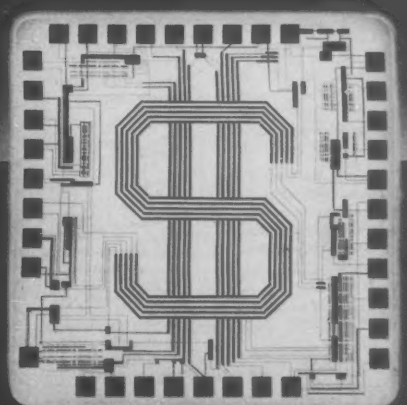
SOURCE: July '82 NTI On-Line Cume Facility. Costs based on 1982 industry estimates

Our audience spends more on computers because they can afford to. They have a higher household income than the U.S. average.

But you're not reaching this high consuming, upscale audience with your broadcast network buys anymore. More affluent viewers are turning to cable TV and away from the networks. The networks just can't deliver these homes like they used to. But ESPN can.

Adding ESPN to a network sports schedule provides greater weight in TV households with cable and particularly pay cable. And because of our heavy concentration of male viewers, we deliver more upscale men per household than the broadcast networks. All for a low out of pocket cost. How do we do it? It's simple. ESPN is the Total Sports Network. And as everyone knows, men love to watch sports. And that's exactly what they've been doing.

So, plug into ESPN's audience and you'll be programmed for success.



ESPN™
THE TOTAL SPORTS NETWORK™

ADVERTISING SALES OFFICES: NEW YORK Michael O. Presbrey (212) 661-6040 · LOS ANGELES David Aubrey (213) 738-6003 · CHICAGO Bob McCarthy (312) 938-4223

Lags Cut From 15 Days to 15 Minutes

DDP Net Puts Brakes on Auto Bureau's Backlog

BATON ROUGE, La. — Automation brought record keeping up to date at the Driver Management Bureau (DMB) of the state Department of Public Safety here, but not quite up to the pace of the bureaucratic process.

With almost one million documents a year to process and an active file of 50,000 motor vehicle operator records for persons who have lost their driving privileges, the DMB in 1980 was a paper-bound manual operation that had become an administrator's nightmare with case backlogs, up to a 15-day lag in ordering license "pickups" and a costly inventory of 120 preprinted forms.

Under that outdated system, a court case file or an accident report was processed through seven different sections in assembly line fashion, and from one to two weeks elapsed from receipt of a new case to issuance of a pickup order for an operator permit and license tags.

Frequent Interruptions

The system was prone to frequent interruptions as case files were pulled from the processing line in response to telephone inquiries, court correspondence and other information requests.

Files were often misplaced, and law enforcement agencies would wait days or weeks for information on license suspensions and revocations.

State officials initially concentrated on word processing, but after studying the issue they instead decided on a distributed data processing system, according to Rex McDonald, assistant undersecretary for information services in the Department of Public Safety.

"The more we looked at it," he said, "the more we felt the need to make everyone a case evaluator and to automate important support functions such as typing, correspondence, data entry and file movement."

Seven months were spent developing and writing detailed functional specifications for the new DMB operation. "Our goal was to create a unit with the flexibility and resiliency necessary to handle our case load at current manpower levels, without overtime, administrative backlogs or additional personnel," McDonald recalled.

Those goals were met, despite the loss of 23 positions due to a budget cut, and the bureau claims employee skills have been upgraded and employee morale and work performance improved.

The department received three bids for installation of equipment manufactured by Wang Laboratories, Inc., Burroughs Corp. and Honeywell, Inc. Benchmark Computer Systems, Inc. was selected to design and implement a Honeywell Office Automation System in conjunction with Honeywell.

Benchmark, a Wisconsin company that has worked with Honeywell systems since 1979 and specializes in law enforcement applications, teamed its computerized central records application package with Honeywell's products to create a 90-terminal distributed data processing network.

The network is driven by paired DPS 6 minicomputers and controlled by Benchmark's on-line 6 transaction processor and Honeywell's Gcos 6 Mod 400 operating system.

Processors Upgraded

The system, McDonald said, has enabled the bureau to upgrade its former assembly line-like processors to evaluators. Personnel are able to call up information on court records and accident reports on which to base decisions and initiate correspondence without resorting to hard-copy files.

McDonald said all but seven of the original 120 preprinted forms have been eliminated, time lags for pickup orders for operator permits have been cut from 15 days to 15 minutes and case backlogs have been substantially reduced despite the personnel cutbacks.

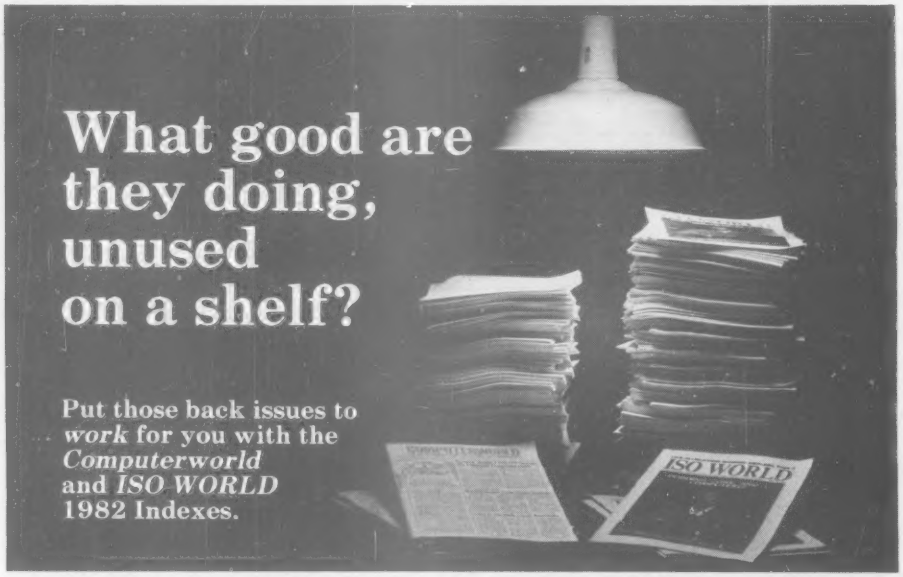
The system delivered by Benchmark "did everything the specs required," according to McDonald, but he added wryly that "our environment is dynamic, whereas the specifications are static."

On top of the seven months required to write the specifications, it required one year to implement the system, and it has been in full operation for one year now.

During that time, the state's legislative body has made several changes in statutes: Drunk drivers must now go through an administrative process with bureau hearing officers, and habitual offenders laws have been stiffened.

These are just two of the many changes that McDonald said has greatly increased volume and "changed the profile of the system.

"We have a list of needed enhancements about a mile long," McDonald said, adding that the department will handle the changes in-house.



You'll get great material for reports, back-up material for purchase decisions, resource material for contracts, research results for long and short-range planning — in other words — a terrific reference library at your fingertips when you use one of our Indexes to access all the information that's stored in your back issues of *Computerworld, ISO WORLD,* and *Computer Business News.*

With the *Computerworld* Index, you get an easy reference (including page numbers and issue dates) to all the information that's packed into all 58 (including *Extra!* and *Computerworld OA)* 1982 issues — 2,636 pages of news, stories, In-Depths, Special Reports, interviews, applications stories, features and tutorials on everything from AFIPS to Zenith.

And in the *ISO WORLD* Index, you'll find entries from 3 issues of *ISO WORLD* and from 36 issues of *Computer Business News* — 913 pages of industry news and trends, features, new product announcements, marketing and distribution articles, perspectives, columns, and analyses, on everything from AB Dick to Zentec.

Take a look at just a few of the hundreds of entries listed in the *Computerworld* and *ISO WORLD* Indexes:

Index	Heading	# Entries
CW	Local Area Nets	70
CW	Microcomputers	81
CW	Graphics Systems	136
CW	Accounting Systems	101
CW	Disk Equipment	126
ISO	Dealers/Distributors	64
ISO	IBM-PC	84
ISO	Floppy Disks	51
ISO	Modems	45
ISO	Retail Stores	53

And that's a sample of just this year. We also have Indexes for *Computerworld* that go all the way back to 1976 and Indexes for CBN back to the first — (Nov. 1978-Dec. 1979)

If you don't have all the back issues of *Computerworld* and *ISO WORLD* that you need to get the articles you want, you can order back copies for the entire year on 35mm microfilm from University Microfilm, Int., Periodical Entry Dept., 300 North Zeeb Road, Ann Arbor, MI 48106 — at very reasonable rates. Or you can simply take advantage of their reprint service for individual articles.

To get your Index, just fill out the coupon in this ad and send it with your check to Indexes/Marilyn Priante, Box 880, Framingham, MA 01701.

Year	Index	Price	Quantity	Total $
1982	Computerworld	$ 39.00	____	____
1981	Computerworld	$ 35.00	____	____
1980	Computerworld	$ 30.00	____	____
1979	Computerworld	$ 25.00	____	____
1978	Computerworld	$ 20.00	____	____
All Computerworld Indexes for last five years (1978-1982)		$100.00	____	____
1982	ISO WORLD	$ 39.00	____	____
1981-1978	CBN	$ 60.00	____	____

Add $1.25 shipping and handling for one book and 75¢ for each additional book. If your check is enclosed, we pay shipping costs. ——→ ____

Total cost ——→ ____

☐ Check enclosed ☐ MC (List four digits above your name)
☐ BA/Visa
☐ American Express ____ Expiration Date

If a charge, we need your signature _____

Name _____

Firm _____

Street _____

City _____ State ____ Zip ____

State Program Uncovers Odometer Tampering

SPRINGFIELD, Ill. — Some used cars up for sale are just too good to be true, and the Secretary of State's Office here is employing a computer to find out just which autos have more to tell than meets the eye.

State officials here estimate that odometers are illegally rolled back on about 15,000 of the 1.6 million used autos that are sold here each year. The practice can inflate the sales price by as much as $1,000 more than the true value.

This past January, Secretary of State Jim Edgar's office implemented a computerized inspection process for all new titles being issued. Officials have been reluctant to publicize details of the process, according to a spokesman, fearing that whatever "information gets out makes it that much easier for unscrupulous dealers to beat the system."

Reportedly, investigators from the Secretary of State's Office will present evidence later this month against five auto dealers who will be accused of tampering.

Officials were not able to provide figures on the number of tampering cases discovered by the computer program, but spokeswoman Ellen Feldhausen observed that "it is working."

Utilizing a Honeywell, Inc. DPS 5 mainframe computer and a software program written in-house, the Division of Motor Vehicles has accumulated a record of 16 million automobiles. When applications for new titles are processed, the program searches for several telltale items that would indicate tampering, Feldhausen said.

Officials said that most rollbacks are made in late-model luxury cars that have been leased, driven hard and turned back to the leasing agency for resale. Other prime targets are cars that have been rebuilt following serious accidents, flood damages and the like, according to officials.

The practice of rolling back odometers to reflect lower than accurate mileage may cost used-car buyers nationwide an estimated $2 billion annually in inflated prices, according to the National Traffic Safety Council.

DEC Manual Explains Maintenance

MERRIMACK, N.H. — Digital Equipment Corp. has published a free 110-page handbook on maintaining its computer systems and associated equipment.

The "Self-Maintenance Handbook" covers service planning, site preparation and installation, remedial and preventive maintenance and product upgrades. It was written for those who find self-maintenance a more effective solution than conventional service contracts, according to a DEC spokeswoman.

The handbook is said to enable users to develop a self-maintenance program, including how to determine whether self-maintenance is the most economical approach, manpower planning, how to determine labor charges, scheduling and maintenance aids.

The handbook can be obtained free of charge from DEC's Installed Base Group at DEC, Self-Maintenance, MK01/W83, Continental Blvd., Merrimack, N.H. 03054.

New Zealand Rep Elected to PTC

HONOLULU — The Pacific Telecommunications Council (PTC) has elected a representative of the New Zealand Post Office to its board of trustees.

Elected to the board was Donald R. Murphy, deputy director-general for the New Zealand Post Office. He will serve as vice-president for external relations on the board. Murphy fills the unexpired term of George L. Lissandrello, who recently resigned.

More information about the council is available from PTC, Suite 303, 1110 University Ave., Honolulu, Hawaii, 96826.

Finally, micro-to-mainframe communication that's:

Our DataTalker™ intelligent front-end processor allows your micro to emulate most IBM terminal systems. Yet it retails for about half of what you'd pay for conventional protocol conversion, software or hardware.

How do we know so much about micro-to-mainframe? Because we've been helping major computer manufacturers solve their communications problems since 1978.

Ready to talk?

Call and ask for our Marketing Support Group. Or send in the coupon.

Either way, you'll find we speak your language. We welcome dealer/distributor inquiries.

Call 1-800-321-7785.

DataTalker™

Tell me more about DataTalker.

Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Phone_____

Winterhalter, Incorporated
P.O. Box 2180, Ann Arbor, Michigan 48106
313/662-2002 TWX 810-233-2423

Relocation Firm Picks Up Revenues With Net

CHICAGO — You might say that Equitable Relocation Management Corp. (ERMC) is in the moving business, except that the firm, based here, does a lot more than transport people and things from here to there. On behalf of hundreds of corporate clients, it also finds homes, purchases employee residences and even provides spouse counseling to aid in the search for employment in a new city.

ERMC has branches in 11 cities and handles about 15,000 employee transfers each year. To facilitate these transfers, in 1980 the firm installed a nationwide distributed processing network with an on-line, central data base in its Chicago facility. The data base and other software are based on two Digital Equipment Corp. VAX-11/780 superminicomputers — a $4 million investment that has paid for itself in just three years, according to Steven Ouzounian, ERMC's director of information services.

"We have an almost airline reservations-like system in which transferees and clients can call and receive current status regarding the relocation," Ouzounian said. "Using terminals, we can tell them exactly how the home sale, move and home finding is going."

Before the Net

"Before the network, we used a large mainframe with remote data entry stations," he continued. "Relocation information was entered daily and batch processed with the printed data returned, in some cases, a week later. With that system, we never had current information, which is vital, especially in the volatile real estate market. In early 1980, we decided to establish an on-line system that would allow interactive access to all data."

For a nine-month period, an ERMC project team examined the firm's operation, streamlined forms requirements and prepared system flow charts. They also retained Peat, Marwick, Mitchell & Co. to assist in writing the requirement definition and establishing conceptual design.

Of the eight manufacturers supplying proposals, the field was narrowed down to DEC, Hewlett-Packard Co., Prime Computer, Inc. and Wang Laboratories, Inc., based primarily on evaluation of data base management, communications and office automation packages. "System expandability also was a key element, as we anticipated increased business volume," Ouzounian recalled. "Following a trip to each manufacturer and a review of system and software, we selected DEC," he said.

Central System

Located here, the central system incorporates a pair of DEC VAX-11/780 superminicomputers, each with 8M bytes of main memory, sharing eight dual-ported RP07 disk drives with 4.128G bytes total storage. A VAX-11/750, also located here, provides 4M bytes of main memory and 512M bytes of storage.

The network consists of 11 nodes using DEC's Decnet protocol, connected in a four-loop, ring configuration via 9,600 bit/sec leased lines. If any link fails, communications continues through the remaining lines. The nodes are located in 11 cities.

At each location is a VAX-11/750 with at least 2M bytes of main memory and a 128M-byte RM80 drive. In addition, there are about 300 DEC VT102 CRTs throughout the system, including 30 used by the DP staff for program development. Hard copy is provided by 100 DEC LA100 printers throughout the facilities and 300 line/min printers for reports at the nodes.

Software includes DEC's VAX/VMS (Version 3.1) operating system, VAX-11 data base management system, Cobol, Decnet, DEC's Datatrieve, DEC's FMS Forms Management and DEC's All-In-One, a VAX-based package for word processing, electronic mail and calendar management. The applications software was written as a joint effort by ERMC and Peat, Marwick, Mitchell. Total system costs, including hardware, were $4 million.

The VAX-11/780s maintain complete financial records for ERMC, along with the status of each client company account. Costs and charges associated with each transferee are posted daily, sorted and compiled to that individual's and his company's account number.

With the new VAX-based system, ERMC plans to increase business and corresponding revenues about 30%, without a corresponding increase in staff. "Our analysis shows a system-cost payback within a three-year period," Ouzounian said, "based on continued productivity and order-volume improvements."

Menu-driven system allows quick selection of screen formats.

Conversion with no surprises.
Call 800-558-5148*

Our free brochure, "Conversion With No Surprises," describes DASD's proven methodology in detail. Ask also for details on our low-cost software conversion "benchmark" offer.

DASD®
PEOPLE/PRODUCTS/RESULTS
DASD Corporation • Corporate Services Center
9045 North Deerwood Drive • Milwaukee, WI 53223 • 414-355-3405
Member of the Cap Gemini Sogeti group
*In Wisconsin, call 414-355-3405, collect.

UniPress Reason No. 2
—UniCalc—
Powerful spreadsheet for UNIX • Extensive help facilities • 255 rows by 64 columns
OTHER REASONS: UNIX for LISA and much more UNIX Software • For more information, contact:
UniPress Software, Inc.
1164 Raritan Avenue, Highland Park, NJ 08904
201-985-8000 Toll Free: 800-222-0550 (outside NJ)
Mastercard and Visa

WHAT IS FASTER AND MORE POWERFUL THAN A TSO CLIST??
PROCMAN!
PROCMAN:
• COMPILES TSO CLISTS
• REDUCES CLIST RUN TIMES
• GREATLY REDUCES CLIST CPU OVERHEAD
• PROVIDES MULTI-LEVEL SECURITY BY CLIST
• ALLOWS EASY ADDITION OF USER FUNCTIONS
• REQUIRES NO SYSTEM OR CLIST MODIFICATIONS
• ENHANCES THE SPF DIALOG MANAGER
TONE Software Corp.
Call or write for details
1735 SOUTH BROOKHURST
ANAHEIM, CA 92804
PHONE: (714) 991-9460
TELEX: 181592

Allows End Users to Program Reports

Report Writer Offers Oil Firm Quick Data Access

FORT WORTH, Texas — In the fast-paced, highly volatile business of oil production and distribution, access to up-to-date information can mean the difference between success and failure.

To support its need for quick and easy access to data base information, Champlin Petroleum Co. turned to an on-line report writer.

The report writer — Answer/DB from Informatics General Corp. — has interactive syntax checking and editing capabilities. It runs on Champlin's IBM 3033 mainframe and is used to produce most of the ad hoc reports for Champlin's on-line production reporting system.

It also helps the firm's executives to use all the information it collects in the process of exploring, producing, refining and marketing its petroleum and gas products.

User Creates Reports

According to Kort Peters, manager of data base administration, reports that previously had been part of a data processing backlog are now being created by the end user.

"After only a few hours of self-instruction, the end users can program an ad hoc report. Typically, in an hour or so with Answer/DB, a report can be created that would have taken a day or two to program in Cobol and required a programmer," Peters asserted.

The advantage of Answer/DB in the Champlin environment, Peters claimed, is that users can tailor their reports to provide exactly the information they want.

"Each user can quickly modify the report to present the information in new ways or answer a different question. As a result, the user often gets answers to questions he had not anticipated," he said.

Champlin's oil and gas production activities are monitored using an integrated on-line system of reporting.

Managers and others using this system are located in a network of regional offices stretching across the U.S. and Canada.

Before the on-line system was installed, the reports, which compile information on the activities of producing oil and gas properties, were prepared manually by clerks at each regional office and submitted to company headquarters for processing into a specific format through keypunching into a card-based computer system.

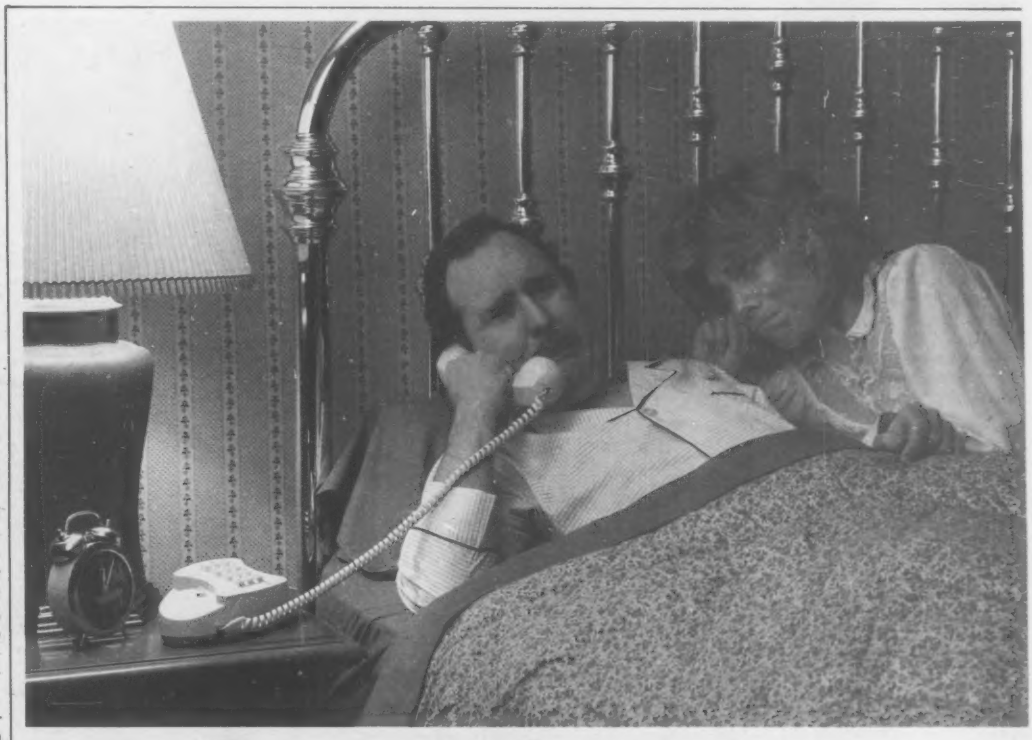
Such a system, with its lack of flexibility, did not enhance productivity. "We needed a system that could accommodate the need for each office to see its data differently, and we wanted to avoid taking a lot of design time trying to anticipate the different needs of respective offices," explained Don Erwin, manager of production management systems.

"This required that we provide end users with the facility to create their own reports," according to Erwin.

Since the company was already using the Informatics Mark IV Implementation System for batch applications in its non-data-base environments, the company was looking for a system that would provide Mark IV-type capabilities, but which could be operated by non-DP end users.

Furthermore, such a system should not require knowledge of Job Control Language or IMS structural language, so that programmers could be freed from the tasks of writing simple reports. To fulfill these requirements, Champlin chose Answer/DB.

For installation at the company, modifications were made to the package to allow it to tie in with the company's IMS menu processing system and to accommodate other special report distribution and data security requirements.



Computer Interruptus

Midnight. And you wish you would be left in the dark. But miles away in the DP Department, a misplaced DD override, an invalid concatenation, or some other equally obscure JCL error brought production to a standstill.

And when the system breaks down, it's you or your staff they call up. Which usually means getting up and getting down there. And after a night like that, how productive will the morning be?

What a waste. If you had the JCLCHECK™ program, you wouldn't have JCL errors, period. None. Zilch. Zero.

Because the JCLCHECK program can catch any and all JCL errors and give you complete, on-line JCL validation and concise error diagnostics. Plus complete documentation on a job stream or entire production system suitable for insertion in the run book. And it can operate under TSO, TONE, ROSCOE or CMS.

Imagine, with no more JCL errors, your programmers can finally concentrate on what you hired them for: writing programs.

So what are you waiting for? Send the coupon or call us at (408) 554-8121 for details. We'll show you how the JCLCHECK program can bring your error detection out of the dark ages, increase production, and eliminate applications backlog. And that'll put you in the spotlight.

© Copyright Triangle Software Company. JCLCHECK is a trademark of Triangle Software Company.

I'm frustrated and tired of JCL errors.
☐ Send me details on the JCLCHECK program.
☐ Have a representative call me.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY, STATE, ZIP _____
PHONE _____
OPERATING SYSTEM _____

Triangle Software Company
4340 Stevens Creek Blvd., Suite 108
San Jose, CA 95129

Exec: Telecommuting Strengthens Manager's

By Marguerite Zientara
CW Staff

MONMOUTH JUNCTION, N.J. — With the increased interest in flexible work schedules in the DP shop [CW, June 20], some firms are turning to telecommuting as a way to save space, decrease turnover and attract a larger portion of the labor pool.

For those contemplating such a move, the challenge of setting up a telecommuting program in DP is not technical but managerial, according to Gil Gordon, president of Gil Gordon Associatesok here, a telecommuting consulting firm.

And once in place, such a program often strengthens a manager's skills by forcing him to manage more actively, Gordon pointed out. "It's an uncanny thing — when you talk to managers of telecommuters, they say it makes them better managers in the office. It serves as a reminder to them of things they may have done intuitively, but with telecommuting must pay more attention to."

Must Set Goals

Telecommuting management forces a manager to set goals, do project reviews and be available for coaching and counseling. "Many traditional managers have the luxury of not doing those things because they have frequent contact with their subordinates, and they practice 'hallway management,' " he noted.

Management at a distance is not a new idea, Gordon observed, since sales representatives, delivery people and meter readers have been managed remotely for some time. "As with sales reps, for example, the manager has the responsibility of recording and highlighting the performance of home workers so the rest of the company doesn't forget about them," he said.

What jobs in the DP department are most suited for telecommuters? "Jobs with a higher degree of predictability, jobs that allow measurement of beginning and end points and jobs in which the need for interaction with people is predictable are most suitable."

For example, a systems analyst can predict at what point in a project he will have to deal with the user, while a sales manager or factory maintenance manager must deal with unpredictable crises requiring immediate action.

Besides systems analysis — data entry, programming, word processing, training program design and systems engineering jobs are ideal for telecommuting, Gordon believes. "At the heart of many failed telecommuting attempts so far are attempts to integrate jobs that don't fit," he noted.

In addition, telecommuting "doesn't have to be permanent or full time. Telecommuters don't have to stay out of the office every day; they can come in once or a few times a week, or just at the point in their project where it's appropriate," he added.

However, Gordon emphasized that ongoing contact with the office is of key importance. Contact can be maintained in a number of ways, he suggested. Routing lists and memos can be sent

System Users To Confer Sept. 18-21

PHILADELPHIA — System applications will be the focus of the Fifth Annual National Users' Conference for Personnel Data Systems, Inc.'s resource management systems here Sept. 18-21.

Sponsored by the vendor, the four-day meeting will feature discussion by system users, focusing on utilization of the human resource management software in various hardware and operating environments. Personnel Data System's products include the Pass personnel system and Accu-Pay payroll system software.

Registration for the conference costs $350. More information is available from Personnel Data Systems at 15 E. Ridge Pike, Conshohocken, Pa. 19428.

If The Pharaohs Would've Had **MRPS**, Cincom's Manufacturing Control System, They Could Have Improved Labor Productivity By 30%.

Building the pyramids was no small job. But then, neither is managing a manufacturing operation. If that's your job, you should know more about MRPS. The next generation of manufacturing control software from Cincom.

Unlike any other manufacturing control software system available, MRPS is designed to produce immediate results. Companies now using MRPS are reporting extraordinary productivity improvements: Inventory levels reduced by 30%. On-time delivery increased to 95%. Overdue purchase orders reduced 45%. Inventory accuracy increased to 95%. Results like these are only the beginning.

As productivity goes up, so does your profit margin. Return on investment comes fast. And because MRPS is so readily adaptable, modifiable and totally flexible to change, optimum return on investment continues well into your company's future.

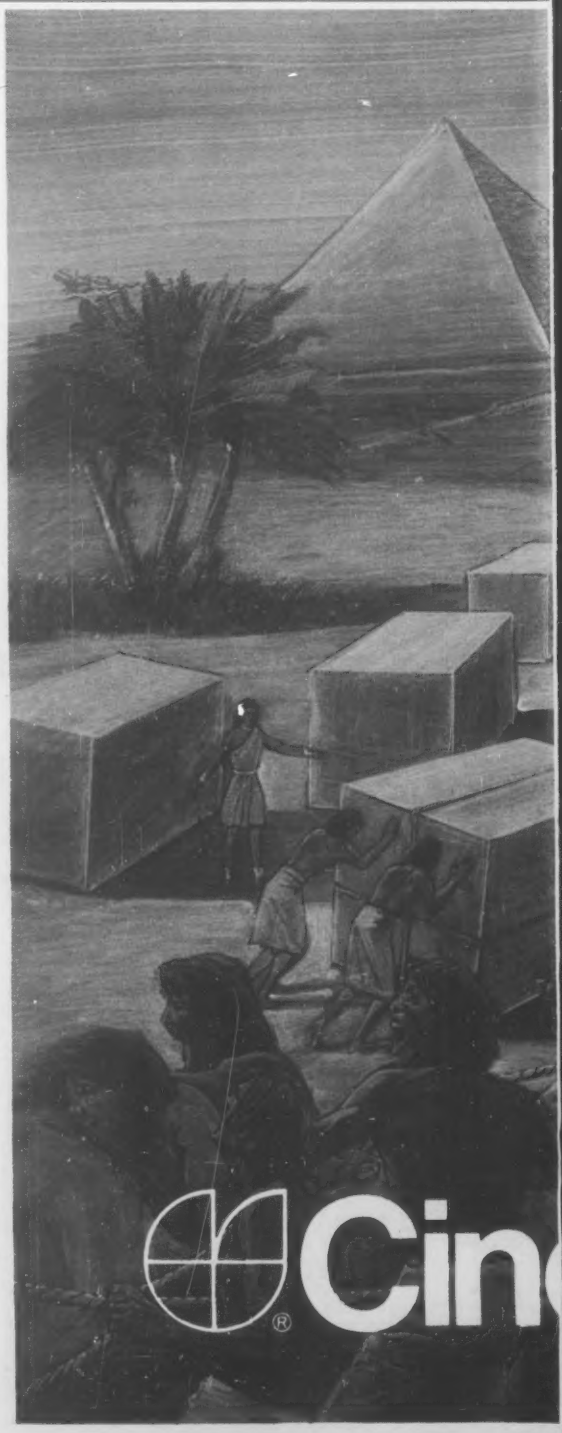
Unfortunately the Pharaohs didn't have access to a system like MRPS to make their job easier. But you do! So don't miss your chance to go down in history as the manufacturing executive who used the building blocks of MRPS to prepare your company for the future.

To find out how much MRPS can improve your manufacturing productivity and profitability, call or write for our free "Return on Investment Analysis."

MRPS from Cincom. The modern manufacturing control software system for today. And tomorrow.

Cincom Systems, Inc.
Marketing Services Department
2300 Montana Avenue
Cincinnati, Ohio 45211

800-543-3010
In Ohio: 513-661-6000
In Canada: 416-279-4220



Skills by Requiring More Active Supervision

via electronic or voice mail; telecommuters can come in for regular departmental meetings; and a "monitor" can be appointed to apprise telecommuters of social events at the office or after work.

Contact Important

Such contact is important not only for the mental health of the remote workers, but also as a way of maintaining their loyalty to the firm. "People working at home all day every day tend to 'go native' and forget whom they're working for," Gordon said.

How does management select the people best suited to telecommuting? "You should select people who know their jobs and whose quality of work is good enough so that you can trust them when they're away from the office," Gordon suggested.

While telecommuting is good for someone who does not need or want hour-by-hour contact with the boss, it is not for the marginal or the learning employee, he added. Telecommuting also may not be good for people with high social needs "who thrive in the midst of a crowd."

And very ambitious people who are intent on climbing the corporate ladder may be uneasy working at home, where they enjoy less corporate visibility, he added. In any event, a worker should not rush into it, but rather do it on some sort of trial basis.

Telecommuting Suggested For Fast-Growing Firms

MONMOUTH JUNCTION, N.J. — What types of companies should — or should not — contemplate a telecommuting program?

"Companies that are growing very fast and bursting at the seams can consider it as a space-saving measure," recommended Gil Gordon of Gil Gordon Associates here. "A company can ask itself, 'Can we consciously decide to underbuild to only 90% to 95% of our needs and fill the rest with telecommuters to save building, heat and service costs?' "

In a metropolitan area, a company that owns its own building could consider vacating a floor of in-house workers and leasing it out to outside tenants. "They may find they'll earn more through a leasing arrangement," Gordon suggested.

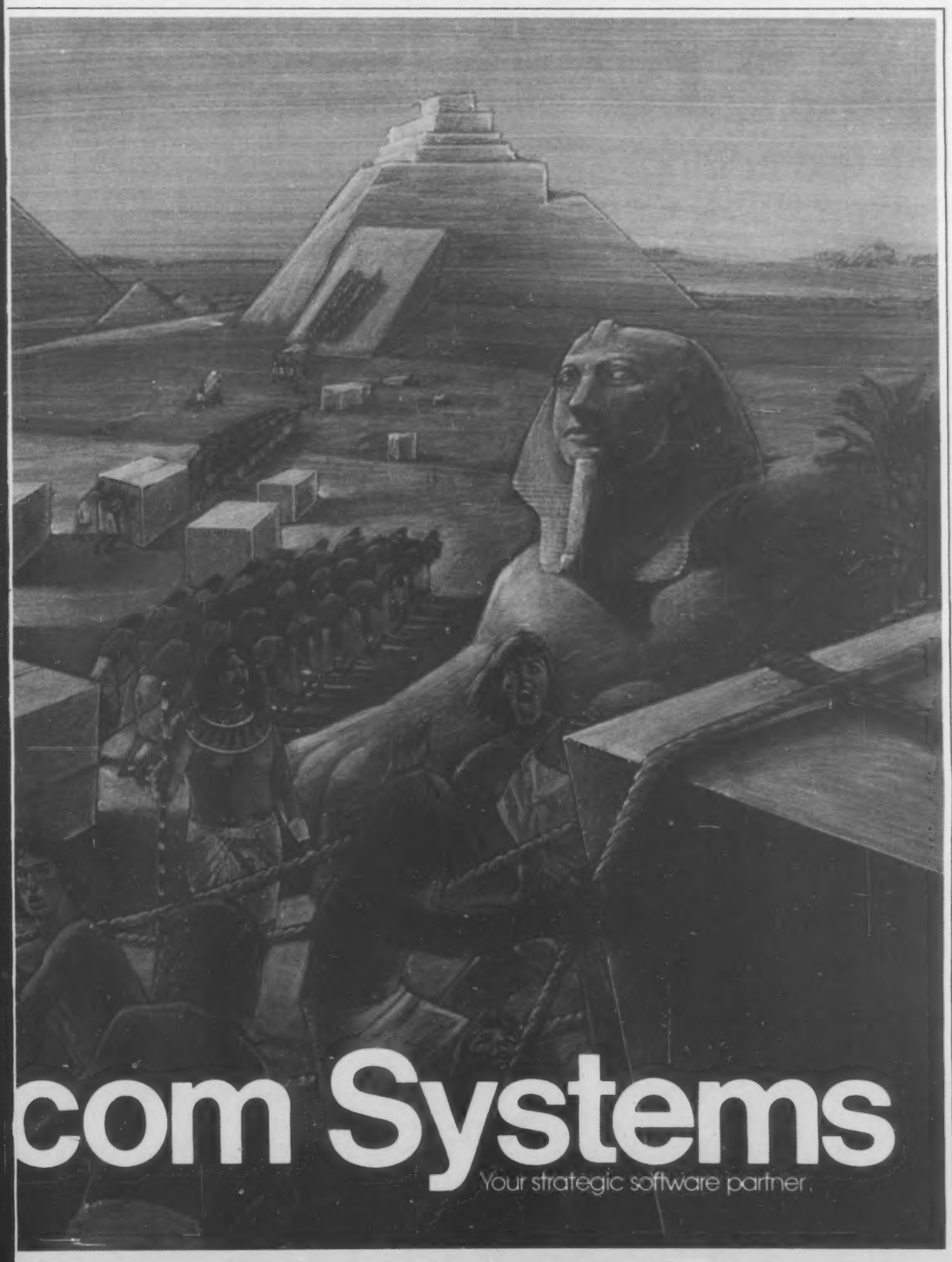
Easing Work Load

In addition, DP departments with computer capacity problems can look to telecommuting to ease the work load on their machinery. "Most on-line computer systems are designed for the first shift, which carries 90% of the work load," Gordon pointed out. Moving some of the work load to the third shift can increase response time, thus improving productivity, and leave more resources available during the day's peak hours.

Also well suited are businesses with a high percentage of information-oriented jobs, such as banking or insurance. However, a company with data security concerns, such as a medical facility, probably would not be appropriate for such a program.

Gordon pointed out that "telecommuting is not a substitute for infant care — that's one of the great myths. Life with an infant is not a predictable existence." However, "in the later months of pregnancy or when the children get older, it's fine."

Companies also should not use telecommuting "as a way to scale back pay and benefits or to bust up a union organizing drive," Gordon stressed, calling it one of the potentially "horrendous abuses" of telecommuting. "Those who would try that are the same managers who would take advantage of word processing equipment's capabilities to count keystrokes and turn the office into a sweatshop."



APPLIED TECHNOLOGY ASSOCIATES, INC.
Proudly announces public presentations of our popular courses in the Washington, DC area

"Hands-on"

CICS/VS COMMAND LEVEL
($650 individual, $575 each for group of three or more)
September 12-16, 1983 November 14-18, 1983

INTRODUCTION TO SAS®
($325 individual, $275 each for group of three or more)
September 14-16, 1983 November 16-18, 1983

ATA • 1710 Goodridge Drive • Suite 1418 • McLean, VA • (703) 442-9030
SAS is the registered trademark of the SAS Institute, Inc., Cary, NC

Justice Department Airs Views On Proposed Hikes in Ecom Rates

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — To pay its own way, Electronic Computer-Originated Mail (Ecom) — the controversial electronic mail service offered by the U.S. Postal Service — must earn enough to repay its development costs with interest, the Department of Justice said late last month.

The department's views, contained in a statement submitted to the U.S. Postal Rate Commission, represent the latest development in a continuing battle between the Postal Service and commercial providers of electronic mail services.

The basic issue at the moment is whether a proposed increase in Ecom rates is adequate. The Postal Rate Commission has to consider this question and issue a recommended decision to the Postal Service's Board of Governors before any increase can be implemented.

Postal Service administrators want the governors to authorize a rate of 31 cents for a one-page Ecom message and 40 cents for two pages. The current rates are 26 and 31 cents, respectively.

In addition, the administrators have asked for elimination of the present 200 message/transmission minimum and for permission to offer a reply envelope, costing 4 cents, as part of Ecom service.

Early last month, the Postal Rate Commission's presiding officer, Janet D. Steiger, asked interested parties to comment on the issues that the commission should consider before writing its recommended decision. The Justice Department filing, which covered essentially the same ground that commercial vendors traversed in their statements, said a major issue is whether it will be possible to detect and prevent subsidization of Ecom by Postal Service monopoly services.

The Justice Department added that the Postal Rate Commission is legally required to consider the impact of Ecom, at the proposed rate levels, on commercial electronic mail services, which generally charge substantially more.

The Postal Service, in its comments, said that "the only matters properly at issue in this proceeding" are whether the proposed rates, elimination of the 200 message minimum and the offering of a 4 cent reply envelope are legal under the Postal Reorganization Act.

The next major development is scheduled for Aug. 17, when postal officials who have submitted written justifications for the proposed changes will be subjected to oral cross-examination.

TEK GRAPHICS DESKTOP PRODUCTS THE GRAPHICS STANDARD

Powerful text editing.
High-speed graphics. Color copies.
The new desktop family from Tek!

VT100 text editing and PLOT 10 color graphics are now packaged as basic desktop units and priced from $3995 complete.

Tek's new 4100 Series desktop terminals answer a range of resolution, screen size, color palette and local intelligence needs.

All three feature 60 Hz non-interlaced displays; rapid 16-bit graphic processing speeds; 38.4K baud communications; easy color selection from the keyboard; 4096 x 4096 addressable display space; compatibility with ANSI X3.64 screen editors; and an unconditional one-year on-site warranty with low-cost extended coverage.

For less than $1600, you can plug in Tek's compact 4695 Color Graphics Copier. The 4695 uses a palette of 125 shades to produce report-size paper or film copies of on-screen displays at the push of a button.

Tek's new 4170 Local Graphics Processing Unit helps you conserve host power while you build on a central data base. The 4170 provides up to 886K RAM for CP/M-86-based standalone programming and pre- or post-processing on any 4100 Series terminal.

Factor in compatibility with Tek PLOT 10 software and 4110 Series terminals, and you'll discover the first desktop graphics you can't outgrow.

For literature and the address and phone number of your nearest Tek sales office, call:

1-800-547-1512.
Oregon only, call
1-800-452-1877.

VT100 is a registered trademark of Digital Equipment Corporation. CP/M-86 is a registered trademark of Digital Research, Inc.

Designs and hard copy courtesy of ISSCO, SASGRAPH™ SAS Institute Inc., Swanson Analysis Systems, Inc. and GDS Applied Research of Cambridge.

Tektronix®
COMMITTED TO EXCELLENCE

Copyright ©1983 Tektronix, Inc. All rights reserved. #UNO-220-1

Grocer Service Organization To Add General Ledger Tools To Aid Members' Flexibility

SEATTLE — Associated Grocers, Inc. (AG), an organization here that services some 329 independently owned grocery stores in the Northwest, will soon provide more than two-thirds of its membership with financial reporting and management software to increase their information processing flexibility.

The customized general ledger packages are from McCormack & Dodge, Inc. of Natick, Mass.

AG purchased McCormack & Dodge's G/L Plus general ledger package in 1981 not only to increase flexibility, but also to provide financial reporting flexibility in the accounting services that AG provides its individual stores, according to Warren Sexton, AG's internal auditor.

New Capabilities

The new package will allow its customers to generate financial reports on general ledger accounting activities, budgeting and profit planning, cost accounting, financial statement presentation and asset management.

"We have never had that capability before," Sexton commented. "For most types of reports, our customers have either worked out the figures manually on a scratch pad or used their gut feeling."

The AG DP department, which operates an IBM 3033 mainframe, is in the process of developing a network through which the independent store owners will be able to interact.

The stores will be using terminals, printers or their own computer systems that range from IBM Series/1 systems to Prime Computer Corp. minicomputers.

Sexton expects the transition from the 10-year-old general ledger system to G/L Plus to go smoothly for AG customers, as the company has already spent 1½ years planning the procedure and changing its own accounting to G/L Plus.

According to Sexton, G/L Plus was chosen over other general ledger packages primarily because of the product's capabilities and flexibility. "With so many capabilities, it was very easy to expound the virtues of the system and draw both AG personnel and our customers into our enthusiasm," Sexton said.

Separate Timetables

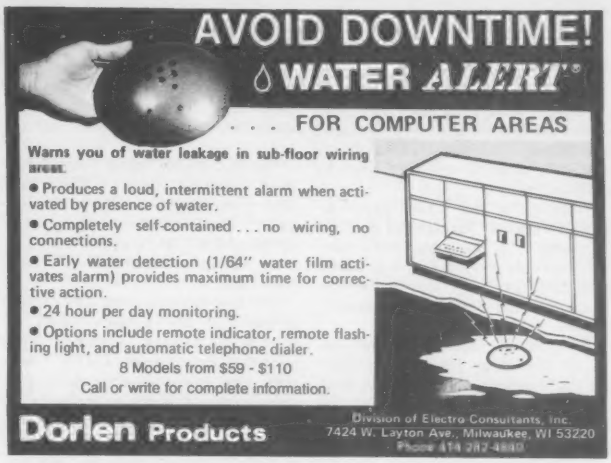
The timetable for the switch to G/L Plus depends largely on each store's fiscal year. Before year's end, AG accountants will work with each grocery's management to determine individual reporting needs.

After the accountant sets up the individualized reporting system, a process estimated to take 30 days, the store's management will spend about five days for training on the use of G/L Plus, Sexton said.

Sexton anticipates little apprehension on the part of the store owners in acquainting themselves with the system.

"We are providing several seminars to introduce them to the systems, and we will provide all the assistance necessary to ensure an orderly and error-free implementation," Sexton said.

For the most part, Sexton said, frustration has centered around the new role each accountant has had to assume. Prior to G/L Plus, all reports were formatted and hard-coded by AG's DP department into the general ledger programs. Now each accountant must learn how to set up a report and code the extracted information, Sexton said.



BEFORE VISICORP™ CHOSE ANSWER™/DB, SOME PEOPLE THOUGHT IT WAS JUST ANOTHER GOOD REPORT WRITER.

Since the recent announcement of a jointly developed Informatics and VisiCorp product, it's clear that Answer/DB is much more.

For the last two years DP professionals have been installing Answer/DB, the personal reporting system, for good reasons.

- Answer/DB operates with standard OS/DOS files.
- Answer/DB, unlike ordinary report writers, features multiple data base access that is transparent to end users.
- Answer/DB accesses IMS, TOTAL, Adabas, IDMS data bases and others too.
- Answer/DB is designed to provide efficient utilization of computer resources tuned by the DP professional.
- Answer/DB also provides security through user profiles designed to selectively control data base access to the record, segment, field, and value level.

While obviously sophisticated enough to satisfy the most professional DP person, Answer/DB is also so simple to operate that end users are very happy with it.

- Answer/DB provides online personal access to data.
- Answer/DB requires no specialized computer background to use and doesn't even necessitate formal Answer/DB training.
- Answer/DB can be learned in less than an hour. It lets end-users interactively and selectively develop their own report requests at a terminal with as few as four easy statements.
- Answer/DB, more importantly, is the key to the intelligent, selective mainframe to micro connection coming very soon.

Incidentally, Answer/DB can be installed today!

CW8/15/83

Informatics General Corporation
(213) 716-1616 Telex 69-8473
21050 Vanowen Street
Canoga Park, CA 91304

☐ Send me the complete details.
☐ Have a marketing rep call.

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone ( )
Computer _____ Operating System: DOS VS ___ OS VS ___
TP Monitor: IMS/DC ___
CICS/VS ___ TSO ___ CMS ___

informatics general corporation

THE SOFTWARE ENGINEERS

Financial Journal Switches to In-House System

NEW YORK — After 18 years of running batch programs on time-shared computers, a weekly financial newspaper here has decided to install an in-house computer system to analyze stocks.

Value Line, Inc., which produces the Value Line Investment Survey for some 115,000 subscribers uses computers as well as input from its own staff of analysts to produce short-term analyses of 1,700 common stocks.

The firm is currently in the process of installing Tandem Computers, Inc. Nonstop II computers running under Tandem's Guardian operating system to replace an IBM 4341 and a Burroughs 6930 located at two time-sharing services.

Also underway is a massive batch-to-on-line software conversion project, which is three-quarters of the way towards its completion, according to Harold Levine, director of data processing at Value Line. Parts of the new and old systems will be running in parallel mode until the conversion's completion, estimated at sometime before January. The process has been hampered somewhat by the fact the newspaper goes to press weekly, Levine said.

The financial journal's use of a computer to analyze and prepare a price/performance ranking of common stocks over a six- to 12-month period goes back to the mid-1930s. The ranks are determined by a computer program that weighs information on stock prices and earnings.

Prior to computerization, the firm was doing a lot of regression analysis using electronic calculator machinery.

"It was deadly," said Value Line's head statistician, Samuel Eisenstadt. Mass producing the regression analysis via computers "not only speeded up the process, but it opened the way to new ideas and approaches," Eisenstadt said.

The key to these computer reports is that they are factually based, involving no human judgment, other than the inital input of data, Eisenstadt said. Since analysts do not always agree with the computer's result, an experiment was devised to test the outcome of the addition of human judgments into the computerized analysis.

"After an exhaustive study, it was determined that [human judgments] neither made a contribution nor hurt what did happen, but that in the process was harmful by creating 'noise' — a shifting in the ranking that provided no benefits," Eisenstadt said.

One benefit of the computerized analysis is that it takes the burden of predicting near-term results of up to a year "off the analyst's back," he added. Among other things, analysts are able to focus instead on three- to five-year forecasts that require a combination of a statistically derived model and the input of the analyst's judgment, according to Eisenstadt. Automation also afforded the firm the opportunity to examine more stocks, which led to the hiring of more analysts to make forecasts, Eisenstadt added.

Neither Eisenstadt nor Levine is aware of any other similar service that uses computer analysis of stocks. One reason may be the prohibitive cost of starting up such a system, which requires a substantial data base extending back through a significant period of time, Eisenstadt said.

Also planned for the future is a "terminal on every analyst's desk" to provide forecasters with better access to the computer's data base, Levine said.

The firm has already installed a number of Tandem T16-6530 terminals, he added.

Bank Officials Land Ansi Posts

WASHINGTON, D.C. — Donald R. Monks, senior vice-president and manager of the Deposit Services Division of Irving Trust Co., New York, was recently approved as vice-chairman of the American National Standards Institute's Committee X9 — Financial Services, the American Bankers' Association (ABA) announced.

Blake Greenlee, vice-president of the International Technology Group at Citibank, was appointed chairman of the X9F subcommittee, which serves as the International Advisory Group of the X9 Committee. Greenlee and Monks were ratified for their positions by members of the X9 Committee, which develops standards for financial services operations.

The X9 Committee oversees and approves the work of several subcommittees and working groups, has published nine standards for the industry and has eight ongoing projects. Thirty-one organizations, including banks, manufacturers, vendors and regulators, comprise the X9 Committee membership. More than 200 organizations are involved in the work of the committee and its subcommittees. The ABA serves as the X9 secretariat.

As part of its responsibility, the X9F subcommittee coordinates, presents, defends and votes the U.S. position to the International Standards Organization Technical Committee No. 68 on Banking, which has 18 member countries.

EQUITABLE LIFE
LEASING CORPORATION
ANNOUNCES
OPERATING LEASES FOR:

Data General
Eclipse® MV/8000II, Eclipse® MV/10000

IBM®
System/36 or 38 4341 Series

digital
VAX® 11/750 VAX® 11/780 VAX® 11/782

PRIME®
750 850 250II 550II

HEWLETT PACKARD
HP® 3000 HP® 9000

WANG®
VS 100

We are a subsidiary of
The Equitable Life Assurance Society
— of the United States, N.Y., N.Y.

EQUITABLE LIFE
LEASING CORPORATION

For more information call any of the offices listed below

Atlanta (404) 256-2434
Boston (617) 237-3660
Chicago (312) 296-6030
Cincinnati (513) 489-3900
Cleveland (216) 398-4800
Dallas (214) 659-9730
Denver (303) 761-3290
Detroit (313) 646-9333
Houston (713) 977-5761
Kansas City (913) 642-8450
Los Angeles (213) 493-5431
Milwaukee (414) 785-9797
Minneapolis (612) 944-8740
New York (201) 881-8200
Philadelphia (215) 628-0350
Phoenix (602) 275-0194
Pittsburgh (412) 343-8122
St. Louis (314) 621-6732
San Francisco (415) 982-0818
Seattle (206) 455-3723

CORPORATE HEADQUARTERS
San Diego
(619) 453-0881

SUBSIDIARY
EQUITABLE/OMNILEASE CORPORATION
San Diego (619) 453-0881
Boston (617) 890-4000
Philadelphia (215) 646-6300
Silver Springs (301) 792-4933

Eclipse is a registered trademark of Data General Corporation. IBM is a registered trademark of International Business Machines Corporation. VAX is a registered trademark of Digital Equipment Corporation. Wang is a registered trademark of Wang Laboratories, Inc. Hewlett Packard is a registered trademark of Hewlett-Packard Company. Prime is a registered trademark of Prime Computer, Inc.

With Multiuser Operating System

Atari Resolves Programmer/System Dilemma

SUNNYVALE, Calif — What do you do when your programmers are married to one operating system, but your requirements dictate the use of another? That was the dilemma facing Atari, Inc., a marketer of home video games and software.

The firm uses minicomputers to develop games for its microcomputer-based products.

However, with the company outgrowing its crop of Digital Equipment Corp. single-user systems, Atari was in need of a multiuser operating system, while still retaining its familiar RT-11 operating system environment.

As a compromise, the company chose a PDP-11-compatible operating system called TSX-Plus from S&H Computer Systems, Inc., based in Nashville, Tenn., to develop software for two video game systems — the 2600 Video Computer System and the newer 5200 Supersystem.

Sharing Resources

According to Mark Davis, manager of software support engineering, by implementing TSX-Plus on more than 20 DEC computers, ranging from LSI-11s to PDP-11/34s, Atari has been able to share costly resources among 45 users, while remaining compatible with existing RT-11 and TSX software and languages, including Basic, Cobol and Pascal.

"TSX-Plus has provided comparable performance to other PDP-11 multiuser operating systems, and it has given us continuity by retaining RT-11's features," Davis commented. TSX-Plus features, he said, include a straightforward directory structure, on-line Help and a familiar core of four or five commands that do most of the work.

"The nice thing about both RT-11 and TSX is that programmers don't have to be completely versed in the operating system to use them," Davis added.

According to Atari, TSX-Plus is a self-contained operating system that entirely replaces the RT-11 kernel. Using the DEC system's memory management facilities, it allows each time-sharing job to access up to 56K bytes of memory with multitasking capability.

It also reportedly supports 22-bit addressing, thereby allowing up to 4M bytes of main memory on PDP-11s.

A real-time support facility allows multiple real-time programs to be run concurrently with normal time-sharing operations, Davis explained.

"The operating system allows us to support up to 20 users on a single machine, providing the standard RT-11 functions plus several useful enhancements," he added. According to the software support manager, TSX-Plus is configurable during the system generation process, so that engineers can select or remove almost any of the features in order to optimize performance.

"In fact, the most recent versions have allowed us to fine tune the system on-line without having to do a new system generation.

"Furthermore, we have been able to run all of our RT-11-compatible software without modification," Davis reported.

Third-Party Acceptance

The acceptance of TSX-Plus by the third-party software community has, according to Davis, resulted in a number of packages that work well in a multiuser environment. "We have enhanced the utility of our installation with several of them, including a cross-assembler, a full-screen editor and a network system," he explained.

To ensure security in a multiuser environment, Atari implemented a system called the Sub-Device system from Omnex Corp. Davis claimed this system provides an enhancement to the basic TSX security controls by permitting the assignment of virtual devices.

"Restricting a designer from an entire physical disk would be problematic since we only have a couple of drives per computer," he explained.

"Instead, this system allows us to establish a file that appears to the system as a device, thereby allowing us to control access very precisely."

EQUITABLE LIFE
LEASING CORPORATION
ANNOUNCES
TAX PRICED LEASES FOR:

Data General
Eclipse® MV/8000 II Eclipse® MV/10000

IBM®
System/36 or 38 4341 Series

digital
VAX® 11/750 VAX® 11/780 VAX® 11/782

PRIME®
750 850 250II 550II

HEWLETT PACKARD
HP® 3000 HP® 9000

WANG®
VS 100

We are a subsidiary of
The Equitable Life Assurance Society
of the United States, N.Y., N.Y.

EQUITABLE LIFE
LEASING CORPORATION

For more information call any of the offices listed below

Atlanta (404) 256-2434
Boston (617) 237-3660
Chicago (312) 296-6030
Cincinnati (513) 489-3900
Cleveland (216) 398-4800
Dallas (214) 659-9730
Denver (303) 761-3290
Detroit (313) 646-9333
Houston (713) 977-5761
Kansas City (913) 642-8450
Los Angeles (213) 493-5431
Milwaukee (414) 785-9797
Minneapolis (612) 944-8740
New York (201) 881-8200
Philadelphia (215) 628-0350
Phoenix (602) 275-0194
Pittsburgh (412) 343-8122
St. Louis (314) 621-6732
San Francisco (415) 982-0818
Seattle (206) 455-3723

CORPORATE HEADQUARTERS
San Diego
(619) 453-0881

SUBSIDIARY
EQUITABLE/OMNILEASE CORPORATION
San Diego (619) 453-0881
Boston (617) 890-4000
Philadelphia (215) 646-6300
Silver Springs (301) 792-4933

Eclipse is a registered trademark of Data General Corporation. IBM is a registered trademark of International Business Machines Corporation. VAX is a registered trademark of Digital Equipment Corporation. Wang is a registered trademark of Wang Laboratories, Inc. Hewlett Packard is a registered trademark of Hewlett-Packard Company. Prime is a registered trademark of Prime Computer, Inc.

FREE 82-PAGE BOOK EXPLAINS TRANSACTION PROCESSING.

A new 82-page book, "SYNAPSE TRANSACTION PROCESSING SYSTEM OVERVIEW", clearly illustrates how a systems designer can accelerate development of a high-performance, fault-tolerant, on-line transaction-processing system.

It discusses automation of integrity and recovery. Tells how to get performance from a Relational DBMS. Describes transparent expansion of a system on line. And it has a complete index.

The book presents a comprehensive, management-level introduction for the nontechnical manager. Yet it provides an adequate overview for the technical manager and staff.

To obtain a free copy, call (408) 946-3191. Or write: Synapse Computer Corporation, Corporate Communications Department CW, 801 Buckeye Court, Milpitas, CA 95035.

© 1983 Synapse Computer Corporation

Slashing Program Analysis Time

Tool Eases Firm's CICS Testing, Debugging

NEWPORT BEACH, Calif. — Application programmers at Avco Financial Services (AFS) took their traditional procedures for testing and debugging CICS programs and threw them out the window six years ago.

Since then, they say, they've cut the time needed for program analysis from days to minutes, improved their program debugging efficiency tenfold and gained the confidence that their new CICS programs won't abend the production system.

"All we needed to accomplish this efficiency was the proper tool," said Dominic Chen, manager of the Information Systems Division at AFS, a Newport Beach, Calif.-based subsidiary of Avco Corp. The tool is called Intertest, from On-Line Software International of Fort Lee, N.J.

Intertest monitors all new or acquired CICS programs, which the Information Systems Division offers the three groups comprising AFS: Avco Financial Services, offering consumer and commercial extensions of credit, bank and thrift services and response marketing; Avco Financial Insurance Group, an international company offering credit, life and specialty casualty insurance; and the Paul Revere Co., an insurance firm located in Massachusetts.

Intertest, which runs on the company's IBM 3033 and 3083, was installed to aid application programmers in essentially three areas: program analysis, debugging and quality assurance, Chen said.

Chen explained how Intertest was once involved in sharply reducing the time needed to analyze a casualty insurance system purchased from an independent vendor. "The system was written in Cobol macro and had many on-line components," he said. "When we decided to make modifications to certain transactions, we ran into some trouble. The vendor provided documentation and program source listing, but since we were unfamiliar with the program, we needed help in determining how the transactions were designed.

"We used Intertest to preset breakpoint conditions so we could evaluate the program as it passed through each area — a procedure which allowed us to establish the transaction flow in minutes. Without Intertest, that analysis would have taken several days."

Productivity has also improved during program testing and debugging, Chen added, because they can be done without a software aid. "Once the program abends, the programmer searches through the core dump to find the coding error. The error is corrected, and then the programmer recompiles the program and reruns the test program — maybe going a little further without an error. This is a time-consuming, static task, because only one program can be traced at a time. It may take a full day just to fix one problem."

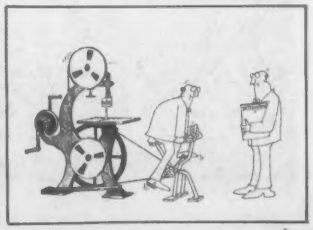
Unlimited Breakpoints

With Intertest, AFS application programmers set an unlimited number of transaction-level breakpoints throughout the program. As the test program proceeds through each transaction, Intertest notes such exceptions as nonnumerical data appearing in numerical fields. These error notations are stored for evaluation at the breakpoint. If a problem occurs, the programmer can use an Intertest command to change the data or machine instructions on-line and reset the program to run up to the next breakpoint.

"A programmer can run through five to 10 breakpoint conditions before having to recompile the program," Chen said.

The quality assurance benefits of Intertest also are very important in this environment, Chen said, because AFS employs numerous junior programmers with little CICS experience. To eliminate major programming errors that may abend the test system, a senior programmer is assigned to review their work. Before Intertest, that review was a manual process. Today, the senior programmer uses the testing aid to set breakpoints throughout the program and review it on-line.

One of the most frequent errors the junior programmers make is releasing the temporary working storage of another program — an error which causes CICS abends in the production environment. Without Intertest, the senior programmer can only find this error by reading a core dump. With Intertest, a message appears on-line, and the senior programmer can correct the situation before it occurs in the production environment, Chen said.



Take your microcomputer business around the world.

The international microcomputer market is booming. An annual growth rate of 40% is forecast through the end of the 1980's. Countries that are recognizing the need to computerize their governments, industries, and universities are looking to low-cost micro computers, thus creating worldwide opportunities. Microcomputers are affordable, adaptable and efficient. And the supply cannot satisfy the demand.

Computerworld's international network of publications has the microcomputer market covered. We'll put you in touch with microcomputer buyers around the world through the special micro sections or monthly inserts in one or more of our 30 publications in 24 countries.

And we now publish separate monthly magazines for the microcomputer users in Australia *(MicroWorld)*, West Germany *(MicroComputerwelt)*, Sweden *(Mikro-Datorn)* and Brazil *(MicroMundo)*. Reporting the latest products and trends, these monthly magazines talk to the microcomputer buyers and users in these markets — in their own language — with locally edited news and international developments.

If you're marketing plans include the international market, the time to act is now. Micros are the fastest growing segment of the computer industry. Whether you want to test the market or are looking for a distributor or representative, we'll put you in touch with the right people around the micro world.

For more information on our international micro coverage, call Diana La Muraglia, Manager, International Marketing Services *toll-free* 800-343-6476 (in Mass. 617-879-0700) or return the coupon below.

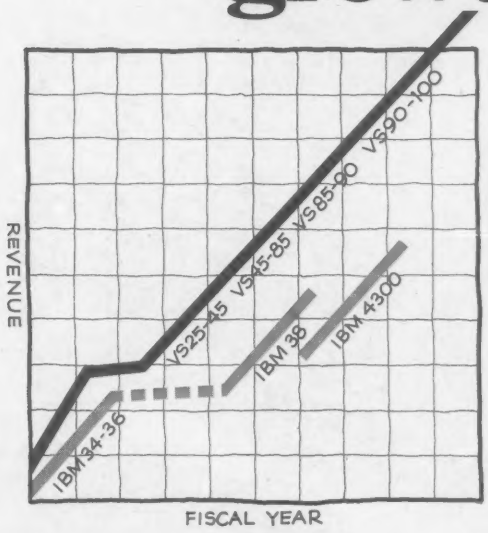
CW COMMUNICATIONS/INC.
375 Cochituate Road, Box 880, Framingham, MA 01701
(617) 879-0700

Diana La Muraglia, Manager
International Marketing Services
CW COMMUNICATIONS/INC.
375 Cochituate Road, Box 880
Framingham, MA 01701
(617) 879-0700

Please send me more information on:
☐ Your micro publications ☐ Your other foreign publications

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____

A computer upgrade with Wang won't stunt your company's growth.



The best reason for choosing a Wang VS computer today may be tomorrow. Because unlike comparable IBM systems, the Wang VS line is a computer family with a smooth, proven and continuous growth path.

Consider. All Wang VS computers use a single operating system and single system software. Once your people are familiar with one Wang VS, they're already familiar with the next.

On the other hand, the IBM 34/36, 38 and 4300 all use different operating systems, different source codes and even different software. Upgrading from one to another is almost like starting over again with a whole new system.

A typical conversion from the IBM 34/36 to a Wang VS computer takes about two months. From then on, no other conversions are necessary.

Converting from the IBM 34/36 to the IBM 38 is a long and tedious process. And you face an even more difficult task going to an IBM 4300. That's time and money that a growing company just can't afford.

If you want to spend more time doing business, and less time getting ready to do business, choose the Wang VS computer line. It won't stunt your company's growth no matter how fast you grow.

For a demonstration of Wang VS computers, call **1-800-225-9264.** Or send this coupon to: Wang Laboratories, Inc., Business Executive Center, One Industrial Avenue, Lowell, MA 01851.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

( ) _____
Telephone

CW1

WANG

The Office Automation Computer People.

© 1983 Wang Laboratories, Inc.

Minicomputer Helps Plant Retailer Monitor Development of Flowers

LITCHFIELD, Conn. — A rose is a rose is a rose, but can it survive the rigors of direct mail?

Probably, especially if a firm uses a minicomputer to monitor every stage of plant development from propagation to harvesting. Such is the case at The White Flower Farm based here, a leading direct mail retailer of perennial plants.

There is a big difference between the type of hard goods usually sold by direct mail retailers and the living plants offered by The White Flower Farm. Proprietor Elliot Wadsworth points out that even the hardiest perennials cannot be stored on warehouse shelves for long periods of time, nor can they be mailed whenever the order is received. Plants must be propagated, cultivated, nurtured and harvested within tightly prescribed seasonal limitations to guarantee plant quality and successful growing in the widely varying climate zones found in various parts of the U.S., he said.

Tight Controls

All of this is tightly controlled by the farm's horticultural staff. They use an IBM System/34 minicomputer to help monitor the stages of plant development. "Visiting" every plant daily, the staff notes their condition and monitors the environmental conditions in the fields and greenhouses. They take whatever corrective action is indicated. Everything is reported to the computer room, via walkie-talkies, directly from the fields.

As they are received, the reports are entered into the system's memory by an operator. Thus, the computer constantly tracks the care and feeding of each of the thousands of plants being nurtured on any given day.

Staffers can consult the data base directly via a display screen terminal in the computer room for an immediate update on a specific matter, or they can consult a once-a-week printout that contains all pertinent management information regarding horticultural operations. The farm utilizes six IBM Model 5251 terminals located in their computer room, bookkeeping and customer service departments and inventory control office. The printer is an IBM Model 5211.

Order processing is also more complex than for hard-goods-oriented direct mail operations. Plants are not taken out of the fields, greenhouses or refrigerators until a day or two before shipment. At that time, they are cleaned and packaged for immediate shipment by the fastest available means.

To assure timeliness, the computer is used to schedule and prompt harvesting, to track counts and locations in a climate-controlled warehouse and to monitor seasonally adjusted shipping dates, which vary for every plant and every region of the country. "It's hard to remember how we did it before we bought the System/34," Wadsworth, who is also editor and publisher of *Horticulture* magazine, said.

The system is also used to process list maintenance and financial control functions at The White Flower Farm.

Leslie Nelmes (right), vice-president/operations, and Karen Delaghelfa, operator, preside over the farm's DP room.

Deltak Training Series Out For IMS/VS Lead Operators

NAPERVILLE, Ill. — A training series designed for lead operators of IBM's IMS/VS operating system was announced by Deltak, Inc.

Compatible with the IBM Interactive Instruction System and Goal Systems International, Inc.'s Phoenix presentation system, the new Deltak four-course series, No. 32-7XX-CE, "IMS/VS Master Terminal Operations," assumes the user has two or three years of experience as a lead operator and is familiar with IBM's ACF/Vtam.

Courses are available for rental fees averaging from $50 to $125 per course. They can be purchased for $1,750 each from Deltak, East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

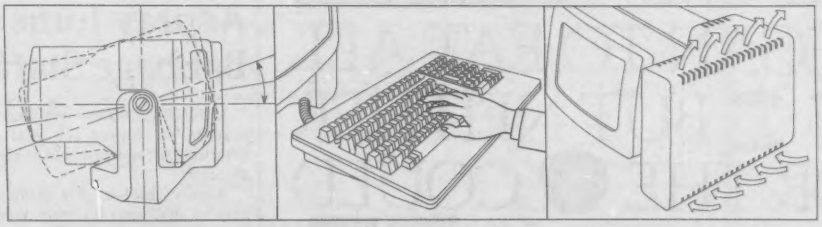
AT&T Information Systems Details Institute's Courses

PINE MOUNTAIN, Ga. — AT&T Information Systems, Inc., formerly American Bell, Inc. has released course details of its Communications Management Institute.

"Office Information Management Resources (OIMR): Where Did the Future Go?" is scheduled for Aug. 22-25, Sept. 12-15 and Oct. 10-13. "Information Distribution Management (IDM): Networking for the '80s" is scheduled for Aug. 29-Sept. 1, Sept. 19-22 and Oct. 17-20.

The OIMR course costs $800; the IDM course costs $920 from AT&T Information Systems, Registrar-CMI, P.O. Box 8, Pine Mountain, Ga. 31822.

The new 970 from TeleVideo. Nothing else looks like it. Nothing else performs like it.



Productive office work depends on people and their equipment working efficiently together.

That's why we have engineered the exciting, new TeleVideo 970 to perform better than any other terminal.

For instance, only our "natural balance" tilting mechanism lets you easily adjust the screen at a touch, so you avoid neck-craning, straining and glare.

Our unique keyboard is designed to avoid user fatigue. We've created a natural palmrest, sculpted keys and the best ten-key accounting pad in the industry. Our non-volatile function keys save time and energy.

Like every feature of the new 970, the screen is designed for ease of use. Our non-glare 14-inch green screen is restful on the eyes, and its 132 column display can format more information. All in highly legible double-high, double-wide characters.

Our communications protocol is the industry standard ANSI 3.64.

As you probably know, most terminal downtime is caused by overheating that results from extended use. There's no such problem with our unique vertical convection cooling tower.

And because we wanted to extend the life of your CRT, we've installed a screen saving feature that automatically turns it off after fifteen minutes of idle time.

Naturally, like all TeleVideo terminals, service is available nationwide from General Electric's Instrumentation and Communication Equipment Centers.

The new 970 from TeleVideo. Nothing else looks like it and nothing else can perform like it.

For more information about TeleVideo's new 970, call 800-538-8725; in California 408-745-7760.

TeleVideo Systems, Inc.
Dept. # 815CW
1170 Morse Avenue
Sunnyvale, CA 94086

Yes, I'd like to know more about the unique 970 from TeleVideo.

NAME_____

ADDRESS_____

CITY_____

STATE_____ ZIP_____

TELEPHONE (_____)_____

California/Santa Ana 714-557-6095, Sunnyvale 408-745-7760, Georgia/Atlanta 404-255-9338, Texas/Dallas 214-980-9978, Illinois/Chicago Area 312-351-9350, Boston/Massachusetts 617-668-6891, New York/New Jersey 201-267-8805, United Kingdom/Woking, Surrey 44-9905-6464

TeleVideo Systems, Inc.

Library Announced By TPG

NEW YORK — A Quality Assurance Library providing standards and support products for data processing quality assurance programs has been announced by The Productivity Group, Inc. (TPG).

Volumes currently available include: User/Data Processing Service Agreement; Cobol, Assembler and Focus Programming Language Standards; Production Service Level Reporting Guidelines; and Post Implementation Review Guidelines.

Also included are: Capacity Planning Guidelines; Testing and Implementation Standards; Telecommunications Standards; Systems Design and Documentation Standards; Quality Assurance Forms Library; Estimating Guidelines; and Terminal Dialogue Guidelines. Prices range from $20. More information is available from The Productivity Group, Inc., Suite 32 S., 305 W. 98th St., New York, N.Y. 10025.

Directory On Satellites Introduced

McLEAN, Va. — Telestrategies Publishing, Inc. is offering the "1983 Satellite Transponder Supply/Demand Analysis and Availability Directory."

The 150-page directory offers a classified section designed to pair available satellite space with business users in search of full- or part-time transponder space. Transponder owners and users can list their equipment available for rent or lease, the time of availability and the terms of usage, the vendor said.

In addition, transponder users and owners can also list their other satellite services, such as uplink and earth-station facilities, the firm said.

The directory costs $595 and will be updated quarterly. Telestrategies is located at 6842 Elm St., Box 847, McLean, Va. 22101.

'It Doesn't Work, I Just Use It to Intimidate People.'

Afips OA Conference Set For Feb. 20-22 in Los Angeles

LOS ANGELES — The American Federation of Information Processing Societies, Inc. (Afips) has scheduled its 1984 Office Automation Conference, "Office Automation and You," for Feb. 20-22 at the Los Angeles Convention Center here.

The fifth annual conference will feature a complete conference program organized in five tracks oriented toward the interests of particular attendees: managers and administrators, technology managers and planners, analysts, consultants and implementors, product designers and developers and end users, Afips said.

In addition to the conference program, Afips is planning a series of half-day and full-day Professional Development Seminars. These seminars will address a variety of topics in the office automation field.

An executive program has been added. This program will consist of a half-day symposium on management issues in the office automation field.

The full conference and exposition costs $100 if paid by Jan. 13, 1984 and $125 thereafter. A single-day exhibition floor and session admission is $40, and admission to the exhibits costs $30.

More information about the conference is available from Afips at 1815 N. Lynn St., Arlington, Va. 22209.

Federal OA Conference Slated Nov. 1-3 in Washington, D.C.

WASHINGTON, D.C. — The National Council for Education on Information Strategies will sponsor the Federal Office Automation Conference Nov. 1-3 at the Washington Convention Center here.

The conference will feature a practicum of how-to-do-it workshops, briefings on technology and sessions that examine office automation problems and solutions, the organization said.

More than 100 representatives of major government agencies and consulting groups are scheduled to appear as speakers. In addition, tutorial sessions, designed by industry and government advisory groups, are scheduled to help educate federal administrators, the organization said.

The full conference costs $250 for federal employees and $350 for non-federal employees. More information is available from the National Council for Education on Information Strategies, which can be reached through P.O. Box N, Wayland, Mass. 01778.

Ansi Announces Title Changes

NEW YORK — The American National Standards Institute (Ansi) has changed the title of its president, L. John Rankine, to chairman of the board. The title of Executive Vice-President Donald L. Peyton has been changed to president.

The title changes were dictated by a revision of Ansi's constitution and bylaws, which was recently accepted by the membership.

Rankine is director of standards and data security at IBM. He assumed office Jan. 1. Peyton joined Ansi as chief staff executive in 1966. He is a member of the Executive-Finance Committee of the International Organization for Standardization and is one of the founders of the Pacific Area Standards Congress.

Aspray Joins Babbage Staff

MINNEAPOLIS — William F. Aspray Jr. has joined the staff of the Charles Babbage Institute as associate director.

Aspray received his master's degree in mathematics from Wesleyan University and his Ph.D. in the history of science from the University of Wisconsin at Madison. His doctoral dissertation on the origins of computer science in mathematical logic has been expanded into a book to be published by Greenwood Press.

The emphasis of Aspray's current research is on the historical development of theoretical computer science, the institutional and organizational development of the computer and the history of mathematical logic in the 19th and 20th centuries.

The Babbage Institute is devoted to encouraging the study of the history of information processing. It is located at 104 Walter Library, 117 Pleasant St. S.E., Minneapolis, Minn. 55455.

IN THE BEGINNING WAS THE
IT PROCESSED DATA DISK FINE FOR
SINGLE USERS LIKE & &
THEN CAME
ALONG & BEGAN TO EAT ALL
THE BUT NEITHER
NOR THE COULD
TRULY DISTRIBUTE THE DATA DISK DATA DISK.
BUT NOW THERE IS THE
EXO Avalanche WITH ITS EXO/NET™,
A -USER
SYSTEM WHICH DISTRIBUTES
ALL THE DATA DISK DATA DISK YOU PROCESS.

All EXO Avalanche™ workstations run on the industry standard CP/M® operating system. Prices begin at $1295. For the best price/performance value on the market, write or call for more information and our complete price list. EXO Systems Corporation, 951 Mariners Island Boulevard, San Mateo, CA 94404. (415) 349-7000.

EXO NETWORKING COMPUTERS

CP/M® is a registered trademark of Digital Research, Inc.

'Do You Like It? It's Made From Fermented Computer Printouts.'

Eliminates Duplication of Forms

WP System Ties to Hospital's Central Data Base

FREMONT, Calif. — Managing a hospital these days requires administrators to pay as much attention to the balance sheet as their doctors and nurses do with patient care.

Washington Hospital here already had computerized systems to handle patient admissions, billing and processing of shared medical systems. What it didn't have was a modern word processing system that could tie into a central data base to eliminate any duplication.

Increasing productivity of the staff with word processing required more than merely increasing the number of pages that a secretary could type in one day, administrators decided. They wanted various departments to be able to share data resources so that individual departments would not have to create, maintain and store similar information separately.

A Honeywell, Inc. Level 6 computer installed in 1978 had proved reliable, but, according to Management Information Services Chief Robert Woods, "it didn't have much capability" in light of the new requirements that had to be met.

The hospital went back to Honeywell and was impressed with the DPS 6 system's ability to run Honeywell's Office Automation Systems software concurrently with data processing applications. In May of 1982, the hospital had installed a DPS 6/54 computer system along with three video workstations and a letter-quality, continuous form printer allowing the elimination of a time-costing step of inserting various forms in the printer for various patient records.

The hospital previously had Lexitron Corp.'s standalone word processing units, but Woods said he found that with the Honeywell systems "we could expand the capabilities of word processing not only throughout the hospital, but at a reduced price per station."

Also purchased was the Info software package from Henco Software, Inc. of Waltham, Mass., for developing small data bases for use within different areas of the hospital.

With it, an accounts payable data base was created, along with a case history data base that is having 140,000 different case records being input, and a smaller data base for personnel that includes information relating to nursing registries.

"Absolutely," Woods replied when asked if the system has performed up to expectations. Honeywell support, he said, was "very good, as much as you would expect."

Since the original installation, the hospital has added a workstation with printer in the Data Services department for use in training and as a shared station for personnel whose requirements don't justify additional stations. The hospital also has added a station in the Medical Staff department where a medical staff master file has been created.

"We recently completed an analysis of word processing needs throughout the hospital and have received a recommendation that we can use a minimum of eight additional stations," Woods said. "I can do that with a minimum of hardware; all we need do is add some memory and port capabilities."

Research Group Won't Copyright RLIN Data Base

STANFORD, Calif. — The board of governors of the Research Libraries Group, Inc. (RLG) has reaffirmed its decision not to register copyrights for the data base of the Research Libraries Information Network (RLIN).

The position "is consistent with RLG's commitment to the unrestrained exchange of bibliographic data," a spokesman said.

"Each institution is free to duplicate and distribute its own records with exactly the same freedom it has in dealing with records held locally," the spokesman said.

RLIN is a compilation of the bibliographic records of all participating libraries.

Each member of the RLG partnership reportedly offers its records for sharing on the network.

The Research Libraries Group is located at Jordan Quadrangle, Stanford, Calif. 94305.

BECOME A VSAM EXPERT.

SysEd's new 5-day VSAM course will make you a VSAM expert. You'll not only learn how VSAM works, but *how to make it work well*, and what to do if things go wrong. Even if you're already using VSAM, you'll gain a better understanding of its capabilities and flexibility . . . like how to select among the options VSAM offers for configuring data sets, both batch and on-line.

Our hands-on case study instruction begins the very first day. You'll write and test three real-life programs and use Access Method Services on our own 4341 / II computer. There are eight 3270 terminals dedicated to the class. You'll receive individual attention from our experienced teachers, and you'll want to bring your actual programming and debugging problems to class.

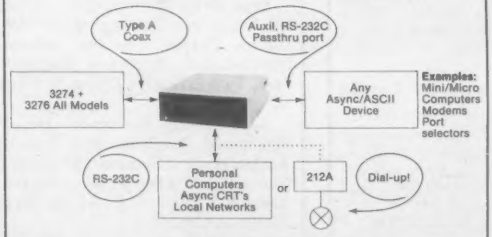
SysEd's VSAM course contains the most up-to-the-minute information available anywhere, including the latest features and capabilities of VSAM, and is in line with state-of-the-art hardware.

SysEd courses are held weekly and on weekends at our training centers in New York City, Chicago, San Francisco and Dallas. On-site courses at your own computer installation are also available. *Classes are limited.* For early enrollment or more information call Dave Shapiro (212) 889-3386.

SYS-ED™

ONE PARK AVENUE, NEW YORK, NY 10016 • (212) 889-3386

NOW! PLUG INTO IBM 3274/6 COAX WITH ASYNC ASCII DEVICES



VIA INTERLYNX™/3278

- Async ASCII to IBM Type A coax conversion.
- 3278 native mode emulation with P.C.'s, async CRT's or hardcopy terminals.
- Use same ASCII terminal on IBM and async network.
- Local or remote BSC/SNA attachment.
- Async dial support on channel-attached IBM 3274.
- File transfer package for IBM PC ($200).
- 25 primary async ASCII terminals supported, 50 secondary terminals.
- PC support for IBM PC ($60), HP-120/125, Apple II/III, Compaq, Xerox 820, VT-180, Rainbow, Osborne, TRS80 II, etc.
- Menu selection of 3278 async pass-through and configuration mode.
- Options stored in electrically eraseable PROM.
- User-initiated disconnect for Micom or Develcon switch.
- Word processor support for Xerox 860 and IBM Displaywriter.
- $1,395 ($995 for 25 or more.) Dealer and OEM discounts available.

LOCAL DATA
2701 Toledo St. Torrance, CA 90503
(213) 320-7126 TELEX 182518

PMS

SERIES I/ASCII IBM® 3101 IBM AUTHORIZED DISTRIBUTOR

GUARANTEED . . .

- LOWEST PRICES
- IMMEDIATE DELIVERY
- IBM WARRANTY

CALL TODAY FOR COMPLETE DETAILS AND QUOTATION.

California Residents 800-272-3222
Outside California 800-423-2853

PMS PACIFIC MOUNTAIN STATES CORPORATION
16525 Sherman Way • Bldg. C-4, Van Nuys, CA 91406

EXPAND YOUR SYSTEM/34 BY ADDING MAGNETIC TAPE

CALL: 800/638-9665

Let one of our Applications Engineers explain how you can attach the Mitron STD 1600 magnetic tape drive to your IBM System/34. (In Maryland, call 301/992-7700).

MITRON
Systems Corporation
2000 Century Plaza
Columbia, Maryland 21044

Calendar

Week of Sept. 11

Sept. 14-16, San Diego — **The Eighth Annual Southern California Regional Users Group (Scrug).** Contact: Scrug, 574 E. Madison Ave., El Cajon, Calif. 92020.

Sept. 15, Washington, D.C. — **Computer-Assisted Manual Writing.** Contact: Promptdoc, 833 W. Colorado Ave., Colorado Springs, Colo. 80905. Also being held Sept. 15 in Washington, D.C., Sept. 27 in Chicago and Sept. 29 in Dallas.

Sept. 15-16, Clinton, Md. — **Introduction to Visicalc.** Contact: Phyllis W. Parrish, Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

Sept. 15-16, San Francisco — **Data Communication: Advanced Concepts, Products and Services.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 15-16, Minneapolis — **Effective Communication Skills for Data Processing Professionals.** Contact: Registrar, Control Data Management Institute, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 15-16, San Francisco — **Ethernet-Type Local Networks.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

Sept. 15-16, San Francisco — **Integrated Information Systems.** Contact: Bob McKane, Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

Sept. 15-16, New York — **Successful On-Line Systems Development.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 15-16, Luxembourg — **International Seminar on Microcomputers in Banking.** Contact: Societe Des Foires Internationales De Luxembourg, B.P. 110, L-2011, Luxembourg.

Sept. 15-18, Minneapolis — **The Second Annual Twin Cities Computer Show and Software Exposition.** Contact: Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

Week of Sept. 18

Sept. 19-20, Chicago — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 19-20, Washington, D.C. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Sept. 19-20, Washington, D.C. — **IBM's Systems Network Architecture: A Master Plan for Teleprocessing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 19-20, San Francisco — **Multifunction Workstations.** Contact: Techtran, P.O. Box 10212, 72 Cummings Point Road, Stamford, Conn. 06904.

Sept. 19-20, New York — **Structured Maintenance: Reducing Costs with a New Methodology.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 19-21, Washington, D.C. — **Successful Use of Minicomputers.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 19-21, Los Angeles — **DL/1 Application Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

Sept. 19-21, San Francisco — **Telecommunications Management: Cost Reduction Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 19-21, Chicago — **Financial Planning Using Graphics and Microcomputers.** Contact: Registrar, Control Data Management Institute, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 19-21, Washington, D.C. — **Developing a Plan for Office Automation.** Contact: The George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

Sept. 19-22, Minneapolis — **CICS/VS Logic and Debugging.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Sept. 19-22, Portland, Ore. — **Structured Analysis and Systems Architecture Seminar/Workshop.** Contact: Jan Crosswhite, Oberland Associates, 4036 N.E. Sandy Blvd., Portland, Ore. 97212.

Sept. 19-22, New York — **IMS/DB (DL/1) Application Programming.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 26-29 in New York.

Sept. 19-23, New York — **CICS/VS Application Programming Command Level.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 19-23 in both Minneapolis and Los Angeles.

Sept. 19-23, Oakbrook, Ill.— **IMS**

(Continued on Page 41)

Database is not for you...

. . . unless you use the latest design methodologies to organize your data for quick and easy access, query, and update. Technology Transfer Institute presents five seminars designed to introduce and train you in the latest database techniques.

Executive Strategies for the Information Age
Robert Holland

New York October 3, 1983

Learn how to build a business model of your organization and how to derive the information resource management plans from it. Bottom-line profitability will be discussed as executives learn how their technology managers can build and/or purchase systems in a phased way to maximize today's installed base of applications.

Database: A Manager's Guide
Robert Holland

Boston September 26–28, 1983
Chicago October 10–12, 1983
San Francisco November 14–16, 1983

Seminar designed for managers who are searching for an understanding of database systems and for a means to design more efficient data structures. Starting with the basic concept of strategic planning of logical database design, Dr. Holland will focus on specifying user requirements and automating the process for database design.

Database: A Builder's Guide
Holland–Cole

Chicago October 31–November 3, 1983
San Francisco December 5–8, 1983

Holland and Cole will focus on specification of user requirements and the automation process for database design. The translation of logical database requirements into a physical database design is stressed.

Information Center Software Selection
Shaku Atre

Washington, D.C. October 24–26, 1983

Ms. Atre will describe methods and tools that allow end users and data processing professionals to work toward a mutually beneficial and productive Information Center. Commercially available products to support Information Centers will be reviewed and compared. Such products as fourth-generation software packages, decision support systems, text processing systems, query languages, and report generators will be covered.

Relational Database
David Upham

Washington, D.C. December 5–7, 1983

This seminar will give you an overview of the relational model, a comparative evaluation of various relational systems, and a detailed look at SQL/DS as an example of a relational system.

For more detailed information
call **(213) 394-8305** or write to:

TECHNOLOGY TRANSFER INSTITUTE

741 10th Street
Santa Monica, CA 90402

Calendar

(Continued from Page 40)

Systems Management. Contact: The Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Sept. 19-23, Fort Lee, N.J. — **CICS/VS Internals**. Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Sept. 19-23, Phoenix — **The Sixth International Conference on Digital Satellite Communications**. Contact: Conference Administrator, c/o Communications Satellite Corp., 950 L'Enfant Plaza S.W., Washington, D.C. 20024.

Sept. 19-23, Minneapolis — **Structured Analysis and Design Workshop**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Sept. 19-23 in St. Louis, New York and Seattle.

Sept. 19-23, Boston — **Systems Design Workshop**. Contact: QED Information Systems Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 19-23, Long Beach, Calif. — **Structured Analysis for Real-Time Systems**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 19-23, Dallas — **Capacity Planning and Modeling**. Contact: The Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Sept. 19-23, Anaheim, Calif. — **Information Modeling Workshop**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Sept. 19-23 in Washington, D.C.

Sept. 19-23, Philadelphia — **Systems Analysis Workshop**. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 19-23, Chicago — **Structured Design and Programming**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held in Anaheim, Calif.

Sept. 19-23, Chicago — **Structured Analysis/Design Workshop**. Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011. Also being held Sept. 19-23 in San Francisco.

Sept. 19-23, Washington, D.C. — **Structured Design Workshop**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Sept. 19-23 in Anaheim, Calif.

Sept. 19-23, San Francisco — **Financial Modeling: A Structured Approach**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 20-21, Palo Alto, Calif. — **The Factory Systems Summit Conference**. Contact: The Yankee Group, 14th Floor, 89 Broad St., Boston, Mass. 02110.

Sept. 20-22, San Juan, Puerto Rico — **The Caribbean Informatics '83 Exhibition and Conference**. Contact: Informatics '83, Suite 219, 3421 M St. N.W., Washington, D.C. 20007.

Sept. 20-22, Boston — **Project Management and Control**. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 20-23, Washington, D.C. — **Structured Design and Programming**. Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Sept. 20-23, Baltimore — **Software Project Management**. Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Sept. 20-23, Anaheim, Calif. — **Data Communications: Components, Systems and Networks**. Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 20-23, San Diego — **Defining Software Requirements**. Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Sept. 20-23, San Diego — **Computer Graphics**. Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Sept. 21, Bethesda, Md. — **How to Write Better Technical Reports**. Contact: Phyllis W. Parrish, Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

Sept. 21-22, Cary, N.C. — **SAS Color Graphics Course**. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Sept. 21-22, Washington, D.C. — **Developing Business DP Systems — A Management Briefing**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 21-23, New York — **Computer Operations Management: Effective Techniques**. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 21-23, San Francisco — **Data Base Systems: Strategies for Information Resource Management**. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Sept. 21-23, Chicago — **Computer Operations: Effective Production Scheduling and Control**. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

DISCOVER THE DYSAN DIFFERENCE

A FREE GIFT From Dysan
With The Purchase of 50 Diskettes

For A Limited Time Dysan Offers You a Bonus Package: 50 Diskettes and a Free Premium of Your Choice. Select From . . .

- A Dysan 50/File, the ideal portable protection for your diskettes.
- A PerfectData™ head cleaning kit, complete with supplies for 26 applications.
- A pair of IBM System 34/38 8-inch diskette auto load magazines.

*PerfectData is a trademark of Innovative Computer Products.

Here's All You Have To Do:

Contact your local participating Dysan dealer. If there's not a dealer in your area, send in the coupon below or call us direct at 800-551-9000, Dept. 50 and ask for the Dysan Bonus Package Promotion.

With every Dysan Diskette Bonus Package you purchase, you receive 50 Dysan double-density flexible diskettes (8-inch or 5¼-inch, single- or double-sided), plus your choice of one of the three premiums listed above.

Precision Dysan diskettes, and a free premium. That's a Great Deal!

Bonus packages are limited to a minimum of 50 diskettes of the same type and size. Offer expires October 31, 1983. IBM magazine offer good while supplies last.

Dysan CORPORATION
Corporate Headquarters
5201 Patrick Henry Drive
Santa Clara, CA 95050
(800) 551-9000

Don't Pass Up This Great Deal From Dysan.

For your Great Deal, contact your local Dysan Dealer. For the name of your local dealer, call Dysan at 800-551-9000 or send us this coupon. And we'll get back to you.

Dysan, show me how to get a great deal on these diskettes:

- ☐ 8-inch single-sided, double-density
- ☐ 8-inch double-sided, double-density
- ☐ 5¼-inch single-sided, double-density
- ☐ 5¼-inch double-sided, double-density

Send to: Dysan Corporation, 5201 Patrick Henry Drive, MS 0114, Santa Clara, CA 95050 ATTN: Dealer Program Manager.

DEALERS: INQUIRIES ON DYSAN'S NEW DEALER PROGRAM ARE NOW BEING ACCEPTED. DON'T MISS OUT ON THIS GREAT OPPORTUNITY.

Name:_____ Title:_____
Company:_____
Address:_____
City:_____ State:_____ Zip:_____
Telephone:_____

DATA GENERAL CORP.

Characteristics \ System	Nova 4	MP/100	MP/200	S/140	S/280	S/20	S/120
Address Space	16 Bit	16 Bit	16 Bit	16 Bit	16 Bit	21 Bit	19 Bit
Communications Protocols	Asynchronous, Synchronous	Asynchronous, Synchronous	Asynchronous, Synchronous	Asynchronous, Synchronous	Asynchronous, Synchronous	Asynchronous, Synchronous	Asynchronous, Synchronous
Memory Size in Bytes (Minimum-Maximum)	32K-64K	8K-64K	16K-64K	128K-2M	512K-2M	128K-2M	128K-512K
Purchase Price (Basic Configuration)	$10,195[1]	$9,829[2]	$11,155[3]	$39,745[4]	$49,410[5]	$17,450[6]	$23,650[7]
Operating Systems	Rdos, MP/OS	MP/OS, DOS	MP/OS, DOS	AOS, Rdos, MP/OS	AOS, Rdos, MP/AOS	AOS, Rdos, MP/AOS	AOS, Rdos, MP/AOS
I/O Ports	1	2	2	9	10	2	1
I/O Channel Speed (Bit/Sec)	2M Input, 1.4M Output	296K Standard Input, 344K Standard Output, 1M-2M High Speed	300K Standard, 3.7M High Speed	2M Input, 1.4M Output, 10M-20M High Speed	2.2M Input, 1.4M Output, 11M-13M High Speed	300K Standard, 4M High Speed	2M Input, 1.3M Output
DP Support?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. Includes 64K bytes of main memory and a dual quad-density diskette.
2. Includes 64K bytes of main memory and a dual quad-density diskette.
3. Includes 64K bytes of main memory and a dual quad-density diskette.
4. Includes 512K bytes of main memory, floating point processing unit, commercial instruction set, 25M-byte disk drive and ROS operating system.
5. Includes 512K bytes of main memory, floating point processing unit, commercial instruction set, 25M-byte disk drive and ROS operating system.
6. Includes 128K bytes of main memory, floppy diskette, 15M-byte Winchester disk drive, CRT terminal and Rdos operating system.
7. Includes 256K bytes of main memory, floppy diskette, 15M-byte Winchester disk drive and the Rdos operating system.

COMPUTERWORLD'S ANNUAL HARDWARE ROUNDUP

Minicomputers

A Survey of 59 Machines From the Top 20 Mini Makers

Next Week: Microcomputers

By Tom Henkel
CW Staff

Technological advances that have made large-scale processors less expensive and microcomputers downright cheap have taken their toll on the minicomputer business.

Improved chip technologies, coupled with very large-scale integration, have given systems manufacturers the ability to sell more processing power at a reduced cost. Many microcomputers, for example, can outperform the early minicomputers and some of the older low-end mainframes. Many mid-size businesses may not be able to afford mainframes, but they can afford the 32-bit superminicomputers that offer the same performance as a small mainframe.

In spite of the business they have lost to both supermini and microcomputer manufacturers, the minicomputer manufacturers have endured. Some have survived by finding a niche that has not been filled — yet — by larger or smaller processors. Others have imbued aging processors with new life by incorporating them into specialized systems. Still others are developing smaller and larger systems to replace older minis.

The industry that gave rise to powerhouse firms like Digital Equipment Corp. and Data General Corp. now appears to be a segmented one. Most of the larger minicomputer firms have branched out and now offer a full line of processors ranging from entry-level microcomputers to mainframe-scale processors. Other vendors have chosen to migrate from the traditional 16-bit minicomputer architecture to 32-bit superminis.

Who buys minicomputers? According to a recent report by Predicasts, Inc., the minicomputer buyer is often a business whose work load is too large for traditional microcomputers but not large enough to justify a mainframe processor. The minicomputer is usually the firm's only processor, although some larger firms buy minis to augment existing computer resources.

Distributed processing applications are another key area for minicomputers. The processors can provide remote users with local computing, plus the capability to communicate with other minis at other sites or with a host processor at the main computer center.

In this week's segment of its annual Hardware Roundup, *Computerworld* has listed characteristics of systems produced by the top 20 minicomputer vendors, determined by 1982 revenues. The revenue information was supplied by International Data Corp., a market research firm in Framingham, Mass.

The format for this week's minicomputer (and next week's microcomputer) charts are somewhat different than the format used in last week's Roundup of mainframes and superminis. Industry analysts contend that users of minis and micros, unlike users of larger systems, are more concerned about solving their business problems than knowing how much raw performance is available in their systems. For that reason, *Computerworld* has eliminated the millions of instructions per second (Mips) and relative performance categories, as well as the internal performance and buffer storage categories. In their place is information about the operating systems and communications protocols supported by the systems in the survey.

DIGITAL EQUIPMENT CORP.

System / Characteristics	PDP-11/23C	PDP-11/23+	PDP-11/24	PDP-11/44
Address Space	16 Bit	16 Bit	16 Bit	16 Bit
Communications Protocols	Asynchronous, Synchronous	Asynchronous, Synchronous	Asynchronous, Synchronous	Asynchronous, Synchronous
Memory Size in Bytes (Minimum-Maximum)	256K-4M	256K-4M	256K-4M	512K-4M
Purchase Price (Basic Configuration)	$12,000	$20,000	$30,000	$60,000
Operating Systems	RT-11, DSM11, RSTS/E, RSX-11M+	RF11, RSX-11M, RSX-11M+, RSTS/E, CTS500	RT-11, RSX-11M, RSTS/E, CTS300	RSTS/E, CTS500, RT-11, RSX-11M
I/O Ports	1	1	1	1
I/O Channel Speed (Bit/Sec)	Not Available	Not Available	Not Available	Not Available
DP Support?	Yes	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes	Yes

IBM

System / Characteristics	Series/1	System/23 Datamaster	System/36
Address Space	16 Bit	8 Bit	36 Bit
Communications Protocols	Synchronous, Binary Synchronous, Asynchronous SDLC	Asynchronous Binary Synchronous SDLC	Binary Synchronous, SDLC/SNA
Memory Size in Bytes (Minimum-Maximum)	32K-512K	64K-128K	128K-512K
Purchase Price (Basic Configuration)	$30,000	$9,705	$34,000
Operating Systems	RPS, EDX, CPS	Internal	SSP
I/O Ports	Not Available	Not Available	10
I/O Channel Speed (Bit/Sec)	Not Available	Not Available	2.5M
DP Support?	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes

Minicomputer Charts Continue on Page 46, 47 and 48

"No matter who you're selling to," remarks Merrill Likes, "the fact that you can go from an inexpensive VAX-11/730 all the way to a million dollar installation without changing software or operating systems is an incredible advantage.

"Digital has done a great job at keeping things compatible and growing," he says. "At providing easy migration paths, and linking things together more and more. With the VAX™ family I can satisfy almost any customer and keep him happy for years."

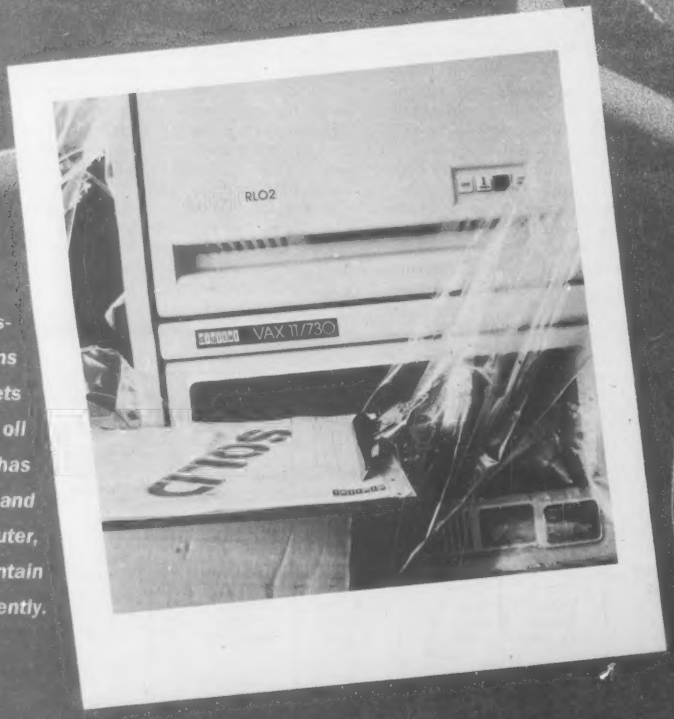
Merrill points to the VMS™ operating system as another key to VAX's commercial success. "Digital really thought it through," he remarks. "It supports all popular languages. It's terrific for interactive applications. Or timesharing. It has exceptional data communications and mass storage. It's the most user-friendly operating system I know about."

Merrill says that the friendliness of VMS software combined with the reliability of VAX hardware is quickly earning the computer a reputation in commercial markets equal to what it enjoys in technical and engineering circles.

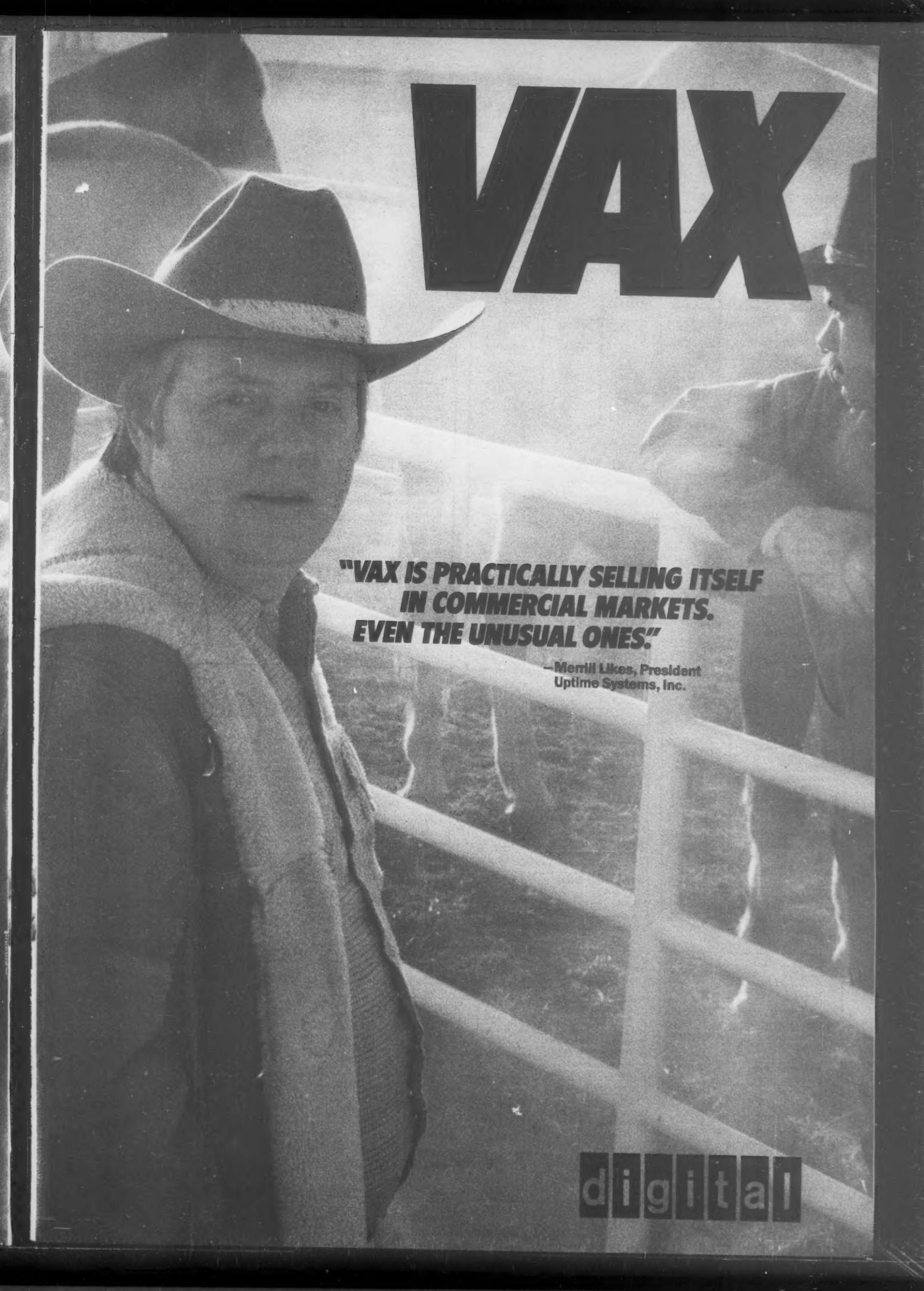
Uptime installed the first commercially-applied VAX-11/730 and had the system up and running on-site in just 90 minutes. "Some of our new customers don't believe what it can do," Merrill laughs. "So we prove it to them. VAX will carry us through the 80s. For commercial OEMs, it's becoming a classic."

To find out what VAX can do for your business, call toll-free: 1-800-DIGITAL, extension 200. Or write: Digital Equipment Corporation, 200 Baker Avenue, CF01/M94, West Concord, MA 01742.

© Digital Equipment Corporation 1983



At Uptime Systems, they customize VAX with applications software for commercial markets like horse and cattle breeding, oil and resource exploration. VAX has made them more productive and more profitable. No other computer, they say, lets them produce, maintain and support software so efficiently.


VAX
"VAX IS PRACTICALLY SELLING ITSELF
IN COMMERCIAL MARKETS.
EVEN THE UNUSUAL ONES."
—Merrill Likes, President
Uptime Systems, Inc.
digital

WANG LABORATORIES, INC.

Characteristics \ System	2200	VS/100	VS/85	VS/90
Address Space	8 Bit	32 Bit	32 Bit	32 Bit
Communications Protocols	Asynchronous, Binary Synchronous, SNA/SDLC, Wangnet	Asynchronous, Binary Synchronous, SNA/SDLC, Wangnet	Asynchronous, Binary Synchronous, SNA/SDLC, Wangnet	Asynchronous, Binary Synchronous, SNA/SDLC
Memory Size in Bytes (Minimum-Maximum)	32K-512K	256K-2M	1M-4M	1M-4M
Purchase Price (Basic Configuration)	$4,300	$8,000	$63,000	$73,000
Operating Systems	Basic 2	VS/OS	VS/OS	VS/OS
I/O Ports	3-9	8	8	8
I/O Channel Speed (Bit/Sec)	Not Applicable	5.2M	5.2M	5.2M
DP Support?	Yes	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes	Yes

NCR CORP.

Characteristics \ System	I-9010	I-9020	Tower 1632
Address Space	8 Bit	16 Bit	16 Bit
Communications Protocols	Binary Synchronous	Asynchronous	Asynchronous
Memory Size in Bytes (Minimum-Maximum)	48K-128K	64K-512K	512K-2M
Purchase Price (Basic Configuration)	$10,000	$20,000	$14,000
Operating Systems	IDPS	Imos III	Unix
I/O Ports	Not Available	Not Available	Not Available
I/O Channel Speed (Bit/Sec)	Not Available	Not Available	Not Available
DP Support?	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes

BASIC FOUR INFORMATION SYSTEMS DIVISION, MANAGEMENT ASSISTANCE, INC.

Characteristics \ System	System 110/210
Address Space	8 Bit
Communications Protocols	Synchronous
Memory Size in Bytes (Minimum-Maximum)	64K-256K
Purchase Price[1] (Basic Configuration)	$47,510
Operating Systems	Boss
I/O Ports	2
I/O Channel Speed (Bit/Sec)	To 9,600
DP Support?	Yes
WP Support?	Yes

1. For a system with 96K bytes of main memory, a 28M-byte disk drive and three terminals.

GENERAL AUTOMATION, INC.

Characteristics \ System	Zebra 5000
Address Space	16/32
Communications Protocols	Asynchronous
Memory Size in Bytes (Minimum-Maximum)	1.5M
Purchase Price (Basic Configuration)	$57,000
Operating Systems	Xenix
I/O Ports	16
I/O Channel Speed (Bit/Sec)	Not Available
DP Support?	Yes
WP Support?	Yes

Charts Continued From Page 43

BURROUGHS CORP.

Characteristics \ System	B20	B96[1]	B930[1]	B2925
Address Space	16 Bit	8 Bit	8 Bit	6 Digits
Communications Protocols	Binary Synchronous, SDLC, HDLC	Binary Synchronous, Asynchronous, Synchronous, SDLC, HDLC, BDLC	Binary Synchronous, Asynchronous, Synchronous, SDLC, HDLC, BDLC	Binary Synchronous, Synchronous, Asynchronous, SDLC, HDLC, BDLC
Memory Size in Bytes (Minimum-Maximum)	256K-640K	512K-1.5M	576K-3M	1M-2M
Purchase Price (Basic Configuration)	$6,695 (256K)	$29,445 (512K)	$23,228 (640K)	$145,000 (1M)
Operating Systems	Btos	CMS/MCP	CMS/MCP	MCP
I/O Ports	4-11	7-10	9[2]	5-16
I/O Channel Speed (Bit/Sec)	To 730K	1M	1M	1.2M
DP Support?	Yes	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes	No

1. The B96 and B930 employ a virtual address space with a logical maximum of 24 bits. The processor, however, employs an 8-bit architecture.
2. Since between four to eight systems can be grouped in a multiprocessor configuration, the maximum number of I/O ports can vary greatly.

FOUR-PHASE SYSTEMS, INC.

Characteristics \ System	IV/40	IV/50	IV/60	IV/65	IV/70
Address Space	24 Bit	24 Bit	24 Bit	24 Bit	24 Bit
Communications Protocols	Asynchronous, Synchronous, Binary Synchronous, Hasp, SDLC	Asynchronous, Synchronous, Binary Synchronous, Hasp, HDLC	Asynchronous, Synchronous, Binary Synchronous, Hasp, SDLC	Asynchronous, Synchronous, Binary Synchronous, Hasp, SDLC	Asynchronous, Synchronous, Binary Synchronous, Hasp, SDLC
Memory Size in Bytes (Minimum-Maximum)	24K-96K	24K-96K	240K-720K	288K-768K	48K-96K
Purchase Price (Basic Configuration)	$62,000	$95,000	$110,000	$130,000	$150,000
Operating Systems					
I/O Ports	Not Available	Not Available	Not Available	Not Available	Not Available
I/O Channel Speed (Bit/Sec)	Not Available	Not Available	Not Available	Not Available	Not Available
DP Support?	Yes	Yes	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes	Yes	Yes

NEC INFORMATION SYSTEMS, INC.

Characteristics \ System	Astra 200	Astra 220	Astra 230	Astra 250	Astra 270
Address Space	16 Bit	16 Bit	16 Bit	16 Bit	16 Bit
Communications Protocols	Asynchronous, Synchronous, 3780	3270, 3780, 3770, SNA, HDLC, X.25	3270, 3780, 3770, SNA, HDLC, X.25	3270, 3780, 3770, SNA, HDLC, X.25	3270, 3780, 3770, SNA, HDLC
Memory Size in Bytes (Minimum-Maximum)	384K-512K	384K-512K	384K-512K	384K-768K	384K-1M
Purchase Price[1] (Basic Configuration)	$8,000	$12,000	$16,000	$35,000	$45,000
Operating Systems	Itos	Itos	Itos	Itos	Itos
I/O Ports	3	7	13	18	27
I/O Channel Speed (Bit/Sec)	To 8M	Not Available	Not Available	Not Available	Not Available
DP Support?	Yes	Yes	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes	Yes	Yes

1. Including printer.

Minicomputers

From the Top 20 Minicomputer Vendors

More Charts on Page 48

MICRODATA CORP.

System / Characteristics	Realty 4700	Sequel 175/3200
Address Space	8 Bit	32 Bit
Communications Protocols	Binary Synchronous	Asynchronous
Memory Size in Bytes (Minimum-Maximum)	64K-512K	512K-4M
Purchase Price (Basic Configuration)	$27,000[1]	$136,000[2]
Operating Systems	Internal	Internal
I/O Ports	8-48	8-128
I/O Channel Speed (Bit/Sec)	Not Available	Not Available
DP Support?	Yes	Yes
WP Support?	Yes	Yes

1. Includes 64K bytes of main memory, a 100 in./sec 1,600 bit/sec streaming tape drive and 32M-byte disk subsystem.
2. Includes 512K bytes of main memory, a 100/50 in./sec dual-density streaming tape drive, 128M-byte disk subsystem and eight I/O ports.

HARRIS CORP.

System / Characteristics	9015	9020
Address Space	16 Bit	16 Bit
Communications Protocols	Asynchronous	Asynchronous Binary Synchronous
Memory Size in Bytes (Minimum-Maximum)	512K	512K-1M
Purchase Price (Basic Configuration)	$9,300	$27,250
Operating Systems	CP/M 86, MS/DOS	CP/M 86, MS/DOS
I/O Ports	Not Available	Not Available
I/O Channel Speed (Bit/Sec)	Not Available	Not Available
DP Support?	Yes	Yes
WP Support?	Yes	Yes

DATAPOINT CORP.

System / Characteristics	Datapoint 1550/2150	Datapoint 1800
Address Space	8 Bit	8 Bit
Communications Protocols	Synchronous, Asynchronous	Synchronous, Asynchronous, SDLC, Binary Synchronous
Memory Size in Bytes (Minimum-Maximum)	32K-96K	64K-128K
Purchase Price (Basic Configuration)	$9,725	$11,770
Operating Systems	DOS-H	DOS
I/O Ports	2	1
I/O Channel Speed (Bit/Sec)	To 9,600	To 9,600
DP Support?	Yes	Yes
WP Support?	Yes	Yes

HEWLETT-PACKARD CO.

System / Characteristics	HP 250	HP 1000 Model 5 Microsystem
Address Space	16 Bit	16 Bit
Communications Protocols	Synchronous, Asynchronous	Asynchronous, HDLC
Memory Size in Bytes (Minimum-Maximum)	256K-576K	64K-512K
Purchase Price[1] (Basic Configuration)	$15,250	$4,750
Operating Systems	HP 250	RTE-L RTE-XL
I/O Ports	5	8
I/O Channel Speed (Bit/Sec)	To 9,600	Not Available
DP Support?	Yes	Yes
WP Support?	Yes	Yes

1. Base list price.

TANDEM COMPUTERS, INC.

System / Characteristics	Nonstop	Nonstop II
Address Space	16 Bit	16 Bit
Communications Protocols	Asynchronous, Synchronous, Binary Synchronous, SDLC, HDLC, Hasp	Asynchronous, Synchronous, Binary Synchronous, SDLC, HDLC, Hasp
Memory Size in Bytes (Minimum-Maximum)	1.5M-2M	768K-8M
Purchase Price (Basic Configuration)	$126,000	$200,000
Operating Systems	Guardian	Guardian
I/O Ports	Not Available	Not Available
I/O Channel Speed (Bit/Sec)	Not Available	Not Available
DP Support?	Yes	Yes
WP Support?	Yes	Yes

HONEYWELL, INC.

System / Characteristics	6/20	Micro 6/40	Micro 6/74
Address Space	16 Bit	16 Bit	16 Bit
Communications Protocols	Asynchronous	Asynchronous	Asynchronous
Memory Size in Bytes (Minimum-Maximum)	512K-1M	512K-1M	512K-2M
Purchase Price[1] (Basic Configuration)	$27,295	$38,400	$81,795
Operating Systems	Gcos	Gcos	Gcos
I/O Ports	5	4-28	2-64
I/O Channel Speed (Bit/Sec)	1.2M	1.2M	1.2M
DP Support?	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes

1. Includes processor, console and 80M-byte disk drive.

TEXAS INSTRUMENTS, INC.

System / Characteristics	Business System 600	Business System 800
Address Space	16 Bit	16 Bit
Communications Protocols	SDLC, 3270, 2880, X.25	SDLC, 3270, 2880, X.25
Memory Size in Bytes (Minimum-Maximum)	256K-2M	512K-2M
Purchase Price (Basic Configuration)	$28,300	$50,340
Operating Systems	DX10, Dnos	DX10, Dnos
I/O Ports	16	40
I/O Channel Speed (Bit/Sec)	To 6M	To 6M
DP Support?	Yes	Yes
WP Support?	Yes	Yes

Minicomputers

Continued from Page 47

NIXDORF COMPUTER CORP.

Characteristics \ System	8845	8860	8870
Address Space	16 Bit	16 Bit	16 Bit
Communications Protocols	Synchronous, Binary Synchronous	Asynchronous, Synchronous	Asynchronous, Synchronous, X.25
Memory Size in Bytes (Minimum-Maximum)	128K	512K-1M	96K-1M
Purchase Price (Basic Configuration)	$30,000	$18,000	$22,500
Operating Systems	Nios	Dipos	Dipos
I/O Ports	Not Available	Not Available	1-24
I/O Channel Speed (Bit/Sec)	Not Available	Not Available	Not Available
DP Support?	Yes	Yes	Yes
WP Support?	Yes	Yes	Yes

MDS QANTEL CORP.

Characteristics \ System	Model 110, 120	Model 220, 231
Address Space		
Communications Protocols	Asynchronous	Asynchronous, Synchronous
Memory Size in Bytes (Minimum-Maximum)	49K-64K	64K-256K
Purchase Price[1] (Basic Configuration)	$14,440	$35,950
Operating Systems	Best, Best/(AOS)	Best, Best/(AOS)
I/O Ports	5	2
I/O Channel Speed (Bit/Sec)	Not Available	To 9,600
DP Support?	Yes	Yes
WP Support?	Yes	Yes

1. Base list price.

POINT 4 DATA CORP.

Characteristics \ System	Mark 5	Mark 8
Address Space	16 Bit	16 Bit
Communications Protocols	Asynchronous	Asynchronous
Memory Size in Bytes (Minimum-Maximum)	64K-128M	64K-128K
Purchase Price (Basic Configuration)	$5,000	$6,000
Operating Systems	Iris, CP/M	Iris, CP/M
I/O Ports	Not Available	Not Available
I/O Channel Speed (Bit/Sec)	Not Available	Not Available
DP Support?	Yes	Yes
WP Support?	Yes	Yes

In computers, think IBM first... From that point on- think CMI

When you decide which IBM system best fits your needs, then decide on CMI. Few companies can match the level of professionalism CMI is noted for.

Our experts in Marketing, Financial Services, Operations and Sales have proven over the years that having CMI on your side is a decided edge.

S/E SUPPORT
S/E support and/or test time can be provided with a system supplied by CMI to ensure a smooth conversion.

IBM ACCEPTABILITY
All CMI supplied equipment is certified eligible for an IBM maintenance agreement.

BRANCH OFFICE SUPPORT
CMI's plan is to keep you as an IBM customer running on IBM Systems.

DELIVERY & PRICE
CMI promises...Fast delivery
Lower purchase price
Lower lease rates
More flexibility

In addition, we can structure a Purchase/Leaseback on your present system and save you money while offering upgrades, lease extensions and purchase options.

CMI Since 1969 CORPORATION

755 W. Big Beaver, 19th Floor, Troy, Michigan 48084

(313) 362-1000

Our Series/1 enhancements set new ideas in motion.

Thanks to what we've done for Series/1, our Value Added Remarketers will soon be able to do even more for their customers.

Nothing takes a smart remarketer farther than competitive products to remarket. That's why it's important news indeed that IBM has announced a series of enhancements for the Series/1.

New product ideas

There's a new high-end processor that doubles the Series/1's memory, supports more terminals and more applications, and represents a major gain in price/performance.

Then there's a more efficient high performance disk subsystem, containing 200-800 megabytes of storage incorporating cache technology for faster access time. A new, economical tape unit, with automatic loading. And a new Series/1 packaging that allows an entire system, including 30 megabytes of disk storage, to be contained in a desktop enclosure.

Moreover, there are enhanced operating systems, supporting more applications and attachments. There is new communications support. And, thanks to improved technology, Series/1 maintenance charges are lower as well.

New tools to work with

Series/1 is really only the beginning. VARs who qualify can also remarket the IBM Personal Computer, Displaywriter, Datamaster, CS-9000, 4300 systems and the new System/36.

Taken together all these systems give existing VARs a new competitive edge, and potential VARs new reasons to join with IBM. All in all, setting new ideas in motion.

For more information please use the coupon or call 1 800 IBM-VARS.

IBM®

CW-8-15

Larry Humphreys
IBM Distribution Channels
P.O. Box 76477
Atlanta, GA 30358

Please send me information about qualifying as a VAR.

Name_____ Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Phone_____

EDITORIAL

No More Than a Promise?

U.S. Federal District Court Judge Harold Greene has apparently settled — finally — the U.S. vs. AT&T antitrust case on terms that could make the telecommunications industry more competitive. But Greene's decision leaves one nagging question unanswered: Why wasn't U.S. Assistant Attorney General William Baxter able two years ago to exact concessions from AT&T similar to those recently imposed on the phone company by Greene?

Perhaps the telephone company was not as desperate for a settlement two years ago. If you look at the record, however, it seems that another conclusion is inescapable.

In April 1981, Baxter vowed to "litigate the case to the eyeballs." That statement was made shortly after he received a letter from the U.S. Department of Defense asking dismissal of the government's charges against Bell.

Two months later, however, Baxter asked Greene to suspend the trial for several months so Congress could pass a telecommunications rewrite bill, S. 898, favored by the Reagan administration. "It would be the administration's intention to discontinue the litigation" if Congress passed the bill, Baxter said.

This idea had originated a few months earlier in a report approved by a White House group known as the Cabinet Council on Trade and Commerce, headed by Secretary of Commerce Malcolm Baldridge. The president "determined that the administration should strongly support S. 898," provided certain amendments were added, Baldridge later told the Senate Judiciary Committee.

Greene shot down this plan in short order, however, by denying the suspension request. Less than a month later, on Aug. 24, 1981, he chastised the Defense Department for letting AT&T help it prepare a report on the effects of divestiture and for letting the phone company use the report in its defense against the government's antitrust charges. The report concluded that breakup of AT&T would harm national security.

What caused the Reagan administration to change its mind about the case? Possibly, it suspected that Baxter and his staff had been too effective. On June 25, 1981, Greene, in the course of denying an AT&T request for quick action on its petition for dismissal of the government's charges, observed that "the government has presented a respectable case." The following September, he denied the dismissal motion. The government had demonstrated that Bell "has violated the antitrust laws in a number of ways over a lengthy period of time," Greene observed.

On Jan. 8, 1982, AT&T and the U.S. Justice Department jointly announced a proposed settlement of the case. The terms were considerably more favorable to the phone company than those subsequently imposed by Greene.

If Baxter had insisted on such conditions late in '81, there is at least a possibility the final settlement would have been reached far sooner, at much less cost to the nation's taxpayers and communications ratepayers. But even more important, Baxter's acceptance of half a loaf suggests that the Reagan administration's professed support of free enterprise is limited to only certain free enterprisers.

This attitude may continue to be a problem, since the Justice Department will be the primary enforcer of the settlement dictated by Greene. As a result, the promised increase in competition may turn out to be no more than that.

LETTERS

Data Base Coverage

I was pleased to see coverage of data base machines in *Computerworld*. Although Vincent C. Rauzino's In Depth article "The Present and Possible Future of Data Base Machines" [CW, June 6] is, in general, a good article, Rauzino has missed a few important facts about the data base machines mentioned in the article.

I would first like to point out that the Amperif Corp. RDM-1100 is not only remarkably similar to the IDM-500, it is an IDM-500. The U.S. Navy is one of Amperif's three RDM-1100 customers, with a system at the Pacific Missile Test Center at Point Mugu, Calif.

The preprocessor Rauzino discusses is only in error, as the accelerator is an add-on board that can be plugged into any IDM-500 and has been demonstrated at another Navy activity to improve complex query processing speed by almost an order of magnitude.

In discussing the Mega/NET system from Digital American Computer, Inc., a significant fact left out is that the system is based on Perkin-Elmer Corp. 3200 series minicomputers.

I have discussed the product with Peter Richards, president of Digital American Computer, and determined that although not a dedicated, special-function device like the IDM-500 or Intel Corp.'s IDBP, it is a product that has potential in a network environment. In this sense, it is not unlike the Encompass system from Tandem Computers, Inc.

As a general comment on another part of the article, the negatives discussed are only partly relevant. With the fastest growing area of data processing being the use of data base systems, to say that conversion to a data base machine is a drawback is shortsighted.

The development backlog at many DP shops is enough to justify and fill a data base machine, leaving conversion to be handled in the normal three to five year redesign cycle attributed to commercial DP shops. Besides which, how else to introduce a new capability — that is, relational technology and associated SQL like user-friendly query languages — than adding a data base machine and trying it out.

My own experience has been that they are well received by end users and analysts alike because they offered the capability to do some things that were impossible beforehand.

I look forward to more coverage of data base machines in *Computerworld*.

Frank Malabarba
Chairman, Navy Data Machine Working Group
Head, Technology Division
Naval Data Automation Command
Point Mugu, Calif.

Systematic Approach

In "Why Are Users Getting Untested Programs?" [CW, Aug. 1], the consultants interviewed for the article noted the lack of a systematic approach or methodology for software testing.

For those wishing a systematic approach, I recommend the following two actions: Use the Institute of Electrical and Electronics Engineers (IEEE) — soon to be American National Standards Institute — standard for software test documentation to help define the necessary documents; or join the working group developing a standard for software unit testing.

Working group membership is open to all.

David Gelperin
Chairman
IEEE Task Group On Software Unit Testing
Golden Valley, Minn.

SOFTLINE /Werner L. Frank‡

Structured vs. Prototyping Methodology

'There is often confusion when considering the use of programming techniques based on structured methodologies vs. prototyping of applications software. It is a common belief that the former is appropriate to the professional programmer, while the latter is identified with making software development simpler for end users. In fact, prototyping could easily be mistaken as a technique to be used solely for end-user programming. Actually, both methodologies can apply to each type of implementor.'

It seems that there are two schools of thought on the subject of software development methodology, and they appear to be diametrically opposite in purpose and approach. One of these methods advocates a strict discipline of determining requirements, careful systems analysis, formal documentation of specifications and subsequent disciplined construction of software. This is accomplished through structured analysis of the application and employing the techniques of structured programming for its implementation.

The second view adopts the seemingly more carefree, ad hoc concept of prototyping, namely, more quickly rendering operational what appear to be the requirements of an end user through experimentation and a show-and-tell scenario.

Is there a place in software development for both of these alternative schemes? Are they a contradiction in terms, or are they complementary methodologies?

There is often confusion when considering the use of programming techniques based on structured methodologies vs. prototyping of applications software. It is a common belief that the former is appropriate to the professional programmer, while the latter is identified with making software development simpler for end users. In fact, prototyping could easily be mistaken as a technique to be used solely for end-user programming.

Actually, both methodologies can apply to each type of implementor. The professional DP practitioner will benefit from either of the two approaches, as will the end user. It is not the development methodology that is distinctive and relevant to one type of implementor vs. another, but rather the selected language syntax and its degree of usability in a specific environment.

Second Confusion

A second confusion may come about due to the belief that prototyping is associated with nonprocedural languages, while structured programming is directed for use with algorithmic procedures. This manner of thinking may also raise other confusing points, namely, that prototyping has something to do with building applications that have limited interest, that such programs have short lives or that they are programs that perform ad hoc reporting. All of these factors may be present in building an application, but they are independent of the issue of selecting structured vs. prototyping approaches.

But before clarifying these issues, a review of some history might be helpful. What gave rise to these distinctive methodologies? In both cases, we are concerned with the software implementation process, from conception of the requirements through placing the system into operation. That is to say, we are seeking software construction productivity enhancement over the entire software life cycle, including:

- Feasibility.
- Requirements.
- Design.
- Specification.
- Programming.
- Testing.
- Installation.
- Operation.
- Maintenance.

Two objectives for these methods are clear:

- Decrease the overall cost of the implementation.
- Assure the highest degree of responsiveness of the software to the actual requirements of the final user.

The craze for structured this and structured that evolved from two quite different corners of computer activity. The first influence derived from the more theoretical wings of the computer world. These are the students of program architecture and logic flow who arrived on the scene with the conviction that algorithmic formulations of computer applications via procedural languages can be done better in the company of structure, be it a more appropriate set of commands or the format in which code is actually composed. This wing could well be dubbed the "go-to less, paragraph indenters" programming advocates.

A second source of concern and interest for bringing order to the programming task came from those responsible for the life cycle well-being of computer programs. These folks dismayed over the horrendous task of maintaining bodies of software in the presence of poor documentation and ever-changing personnel. This faction might be called the "spaghetti unravelers," concerned with the elimination of confusion and endless paths that are too often present in a computer program.

Ultimate Support

While these influences may have created the initial enthusiasm for a structured discipline in design and programming efforts, the ultimate support for these methods came from the overall desire to improve the integrity of software. Structured approaches were deemed to provide the means to uncover clearer understanding of users' needs, together with ending up with more reliable code. The emphasis, therefore, in

(Continued on Page 52)

HUMAN CONNECTION /Jack Stone‡

A Nation of Computer Illiterates

Time magazine's optimistic coverage of personal computers in its Jan. 3, 1983 "Machine of the Year" issue captured the essence of the developing marketplace in these memorable words: "Whatever its variations, there is an inevitability about the computerization of America. Commercial efficency requires it, Big Government requires it, modern life requires it, and so it is coming to pass."

The first step in making it come to pass is computer literacy — for everyone.

Time's reporting is only a sample of the torrent of publicity surrounding the rapid growth of these machines around the world, in all sectors of Western societies — industry, education, science and government. No one can escape the conclusion that the personal systems make up a very important part of our lives, either directly or indirectly, and that in the future, their influences will surely increase in the work place, the school and the home.

Consequently, the needs of the population at large for an understanding of the technology is surely obvious by now, having received extensive coverage in the public and academic press.

The media have enthusiastically reported on numerous valuable and creative efforts under way in many areas to bring such instruction into the classroom.

Small Percentage

Yet in spite of some impressive successes, it turns out that only a small percentage of the total population has been able to attend such courses; this is due to the relatively high cost and limited availability of these courses. Take, for example, the current situation in American schools: There are about 100,000 systems in these institutions today. On the surface, this figure seems to be large; but when prorated against the total population, there is only one for about every 400 pupils.

The plain fact is that from the perspective of current knowledge of computers relative to the totality of needs, the nation is terribly illiterate.

This conclusion was confirmed just a few months ago when a federal government commission recommended a major reorientation of the high school curriculum to improve the excellence of math and science education, including a half year of basic education in computer science for every student. Happily, recent events have indicated that state and local leaders have taken the admonition to heart and actively debated what should be done.

What It Takes

Although there is no general agreement within academia or the industry on what it takes for an individual to build a competency in computers, it is certain that at least American school children have got it. On this point, Louis Robinson, director of university relations for IBM, recently stated in *The New York Times*, March 30, 1983, that "Computer literacy is more often defined as the ability to use computer technology in a particular discipline. It does not imply that the person is a world-class programmer. It is a skill like driving an automobile and being able to get to Cape Cod, for example. That is very different from knowing how to take a car's transmission apart. Kids, as well as adults, can be taught computer literacy."

School children set a torrid pace for adults, the vast majority of whom are concerned about their own capabilities for comprehending something that seems to be as complex or abstract as a computing machine. Kids have had too little experience in life to have developed fears or biases toward these devices, and they certainly don't have jobs or social pressures as excuses.

Most importantly, the average grade schooler chooses to learn about the machines, and quite frankly, there is absolutely no reason why any serious-minded adult cannot make the same decision.

But the machines aren't all that easy for adult beginners. The author agrees with *Time*'s assessment of this matter: "Certainly, the personal computer is not without its flaws. As most new buyers soon learn, it is not that easy for a novice to use, particularly when the manuals contain [highly technical] instructions."

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

Comparing Software Development Schemes

(Continued from Page 51)

structured design and structured programming was to achieve two aspects of reliability for applications systems:

- That the system have a minimum of errors.
- That the system match the requirements of the ultimate user.

Clearly, the structured approach for developing software, combined with adequate inspection techniques, meet rather well the first objective, and perhaps not as well the second. For how can the systems analyst be assured that his perception of the requirements really reflects the needs of the end-user customers?

It is, undoubtedly, because of the last question that the prototyping enthusiasts first came to the forefront. It was observed that systems analysts and end users often had difficulty in communicating, both verbally and through the written word. It was hard for the user to understand and express requirements, and it was equally difficult for the programmer/analyst to perceive the needs. Setting up a prototype allowed the user not only to test out understanding, but also permitted an iterative process for articulating the requirements through live and active demonstrations rather than a bland paper design.

One could argue, however, that prototyping really came about as a result of the emergence of two technical tools: the data management system and automated screen painting. This combination of support software provides the ready means to accomplish a significant reduction in software implementation time, in some cases by an order of magnitude.

Indeed, this technology has even been designated as fourth-generation capability to underline the leverage achievable in implementing an application. It was found, for instance, that reasonably complex applications can become operational in a matter of days, and with associated powerful report writers and screen dialogue generators, the application can be quickly modified in trying out various processing and presentation schemes.

So why not use this high-powered tool in an existential process with the user. The "try it, you'll like it" test for ascertaining user-functional requirements, on the one hand, and user preferences for presentation style, on the other hand, could be cheaply achieved via this technique. Having the capability and using it may be the major reason for inventing a term describing it, namely, "prototyping."

Real Dangers

But that is not necessarily what happens in real life. In fact, there are some real dangers in putting the prototyping capability into the hands of applications builders. The easy tendency is simply to leave the prototype in place for operational use, skip the hard part of documentation and building the application once more by more traditional schemes and go on to another project.

But why not accept such a situation. After all, this obeys one of the fundamental precepts of life: If it works, leave it alone. But the critics would point out that prototyping leads to slipshod results, employs shortcuts and bypasses careful and perhaps exhaustive system analysis and adequate testing and documentation. The method is sometimes negatively described as a trial-and-error approach and is likened to shooting from the hips.

Yet one can point out the best of scientific and engineering methods that have adopted prototyping as the key to their development. This is the case in the use of wind tunnels for developing airfoils and aircraft, as well as the ship model basins employed in testing out new boat designs. These techniques have now been largely supplanted by computer modeling and simulation. So why not use the computer in the same kind of a role when it comes to designing computer applications themselves?

The analogy falls short because unlike the case of airplanes and boats, where prototyping necessarily leads to a subsequent production cycle, a software prototype can become the final product.

Software builders should use both prototyping and structured techniques, perhaps in that order. In such a world, perhaps one can have it both ways. Prototyping can sharpen the translation of user requirements into a satisfactory human interface for I/O formats and procedures, while the structured programming effort will assure implementation completeness and reliability.

Frank is an independent consultant and president of the Werner Frank Computer Group located in Calabasas, Calif.

COME TO CALIFORNIA FOR BUSINESS.

ANNOUNCING THE SECOND EXECUTIVE MICROCOMPUTER CONFERENCE & EXPOSITION.

EMCE is the one show for marketers who mean business about the business and professional microcomputer market.

And now, following the success of our premier show in New York City, EMCE comes to Southern California. For you, this means a unique opportunity to tap the single richest segment of the explosive micro market — in the hottest computer region in the world.

But EMCE is not for everyone. It's not for those who sell to hobbyists. It's not for those who sell games. It is for a select number of high quality exhibitors interested in reaching an equally select, equally high quality, business and professional audience.

And it's the only micro show sponsored by the Conference Management Group of CW Communications — publishers of Computerworld, InfoWorld, PC World and ISO World.

There's really no other opportunity like it. But you must act quickly. Exhibit space is limited, and like EMCE New York, it's going to sell out fast.

FOR EXHIBIT INFORMATION CONTACT:

Ms. Doris Rosner
Mitch Hall Associates
Box 860
Westwood, MA 02090
Phone: 1-617-329-8334

EMCE™

The Executive Microcomputer Conference & Exposition.
October 5 - 7, 1983 ▪ Long Beach Convention Center ▪ Long Beach, California

EMCE is sponsored and promoted by the Conference Management Group of CW Communications, Inc. — publishers of Computerworld, InfoWorld, PC World and ISO World.

'Our System Costs More Because We Charge You More.'

Manages $8.5 Billion Program

Tracking System Keeps MTA in Line

NEW YORK — Faced with a drop in ridership on its subway and bus facilities of more than 22% between 1970 and 1980, the New York Metropolitan Transportation Authority (MTA) was forced to take action.

Lee Hennig, director of the MTA capital program administration, said the action was to undertake a five-year, $8.5 billion capital improvement program that is being managed by a computer-based project tracking system developed by Multiplications, Inc. of Cambridge, Mass., with its Accolade CICS application development system.

The MTA determined that it would cost well over $55 billion to replace its transit assets. Based on their useful life, it was felt that the MTA should be spending over $1 billion per year for capital reinvestment. However, financial constraints on the MTA's funding sources — New York City and surrounding counties and state and federal governments — have limited that reinvestment to about $300 million a year, which was far too little to do the job.

'In mid-1981, the MTA began to reorganize to resolve the internal problems that it had previously experienced in managing capital projects and monitoring outside design and construction work. [A computer-based] system was operational and fully under MTA control on March 31, 1983.'

Hennig recalled that during the 1970s, the transit agencies in New York were criticized for delays that occurred as a result of capital project approval and administration procedures. To address this problem, the state legislature approved legislation in 1981 that centralized approval procedures for capital projects within the MTA.

In mid-1981, the MTA began to reorganize to resolve the internal problems that it had previously experienced in managing capital projects and monitoring outside design and construction work. "Management understood that the scope of the new five-year program would only compound those problems," Hennig said. "If the $8.5 billion budget were to be divided into daily increments, MTA managers would be responsible for administering over $32.5 million in capital construction expenditures every working day — expenditures distributed over scores of projects, hundreds of contractors and thousands of vendors, generating millions of pieces of information to be recorded, managed and

(Continued on Page 54)

Sage Decision Support System Available for IBM VM/CMS

PRINCETON, N.J. — Sage Data, Inc. has announced that its Sage System menu-driven decision support system is available for the IBM VM/CMS environment.

Utilizing a menu structure, the Sage System provides an end-user-oriented environment for time-series analysis, modeling, forecasting and preparation of presentation graphics and reports, the vendor claimed. Users are prompted to select their next command, which may be abbreviated to a single character.

All Sage System functions are fully integrated and have a common command structure. Movement through data analysis, modeling, reporting and graphics is user-transparent. The package can also be integrated with Issco, Inc.'s Tell-A-Graf to produce graphics output.

The Sage System costs $45,000 for a permanent license, $15,000 for an annual license and $1,500 on a monthly basis. Sage Data is located at 104 Carnegie Center, Princeton, N.J. 08540.

Tape Management Series Out

JERICHO, N.Y. — Computer Associates International, Inc. has introduced a tape management family for the IBM VM/CMS environment.

The CA-Dynam/CMS family comprises the CA-Dynam/T tape management system and the CA-Dynam/B backup and restore facility. Together, the packages are said to provide CMS file control and efficient use of tape and direct-access storage device resources for IBM and compatible mainframes operating under VM/370 Release 6 with basic systems extension programs product/systems extension programs product and all releases of VM/SP.

CA-Dynam/T costs $5,500 for a three-year lease, and CA-Dynam/B costs $3,000 for a three-year lease. Both can be purchased for $7,000 on a three-year lease. Computer Associates International is located at 125 Jericho Tnpk., Jericho, N.Y. 11753.

Productivity Tools: An Effective Aid For the DP Manager

By Charles Wang
Special to CW‡

Today's data center manager is faced with an increasing demand to manage his area of responsibility according to the same professional standards demanded of his corporate colleagues. However, he is still faced with the task of filling a five-pound bag with 10 pounds of grain. Often, programmer productivity software can help minimize the strain.

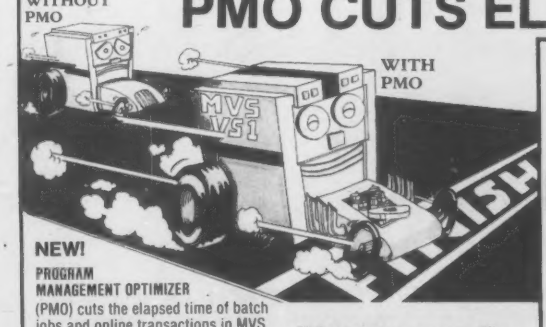
In most installations, there are five main budget items to consider: hardware, personnel, maintenance, software and computer supplies/environment.

Hardware. Expenditures include acquisition and disposition of each piece of hardware and any upgrades for additional equipment. It is the DP manager's job to know when contracts expire, whether to retain or dispose of expired equipment and how much more equipment will be needed based on growth projections.

The manager should also keep track

(Continued on Page 56)

PMO CUTS ELAPSED TIME!



NEW! PROGRAM MANAGEMENT OPTIMIZER (PMO) cuts the elapsed time of batch jobs and online transactions in MVS or VS1 operating systems. PMO greatly reduces I/O contention to critical datasets, saving you time and money.

With PMO, you set records! PMO maintains performance statistics as part of its normal operations. They are available in online display or as hardcopy.

PMO requires no system modifications or user program changes. It goes up in minutes. NO IPL is required for installation or updating.

PMO has saved many users countless hours of unnecessary directory searches. Let PMO put you first across the finish line with the fastest elapsed time!

SHARED DEVICE MANAGEMENT SYSTEMS

DUQUESNE SYSTEMS SHARED DEVICE MANAGEMENT PRODUCTS provide a comprehensive solution to the problems caused by sharing data and devices. You get all of the benefits of interaction between two or more computer systems without all of the problems.

SCON — SUPERCONSOLE (SCON) helps improve operating systems productivity in MVS multi-CPU installations. By providing one console image for multi-system environments, SCON lets an operator monitor a single stream instead of many . . . reducing hardware and people costs!

SDSI — SHARED DATASET INTEGRITY (SDSI) overcomes integrity problems and reserve lockouts on shared DASD . . . without system or program modification! SDSI protects data against concurrent update and eliminates device reserves with *no* user program changes.

STAM — SHARED TAPE ALLOCATION MANAGER (STAM) manages your shared device pool with automated allocation. STAM eliminates the need for manual control and provides the ability to share tape drives and mountable disks.

DUQUESNE SYSTEMS INC
TWO ALLEGHENY CTR. • PITTSBURGH, PA 15212
PHONE: 412/323-2600 TELEX: 902 803
SYSTEM SOFTWARE LEADERS SINCE 1970

To find out why the most knowledgeable DP installations rely on DUQUESNE SYSTEMS' Products . . .

Please send me information on:
☐ PMO ☐ SCON ☐ SDSI ☐ STAM
Name _____
Company _____
Address _____
City _____ State _____ Zip _____
Tel. _____ Operating System _____

30 DAY FREE TRIAL!

System Keeps New York's MTA on Track

(Continued from Page 53)

analyzed," he explained.

The task of managing all of that information fell to Central Tracking (Centrak), the system designed by Multiplications. "Effective management of a capital program as large as this one requires timely review of all relevant information," according to Mortimer Downey, the MTA's deputy executive director for capital programs. "We have developed a system that can manage the vast amounts of information we need to control costs and schedules." Centrak performs that management function for all four of the operating agencies of the MTA: the MTA "home office," the Long Island Railroad, Metro-North and the New York City Transit Authority.

Centrak was designed to give MTA management the ability to determine the current status of every project. It allows managers to track procurement activities, work orders, contract payments and identify quickly any delays or potential cost overruns. Downey described it as "our early warning system."

Programming of the massive, 136-screen Centrak system began April 15, 1982 using the Accolade application generator system. Initial operation of a portion of the system began on July 1, 1982. The entire system was operational and fully under MTA control on March 31, 1983, making Centrak the first major project actually completed under the $8.5 billion program. "We had a system in place in only twelve months," Hennig said.

Centrak is on-line and menu-driven, he explained, providing instant access to all users. Currently, there are 55 CRT terminals in use at the MTA. MTA programmers will continue to use Accolade to build additional applications.

Tess Czajkowski, on-line systems manager for the MTA, said, "Accolade takes the drudgery out of programming by generating the required code for an on-line application, yet it allows the programmer the flexibility to flesh out the skeleton generated."

All of Centrak's functions are integrated through a common data base. According to Hennig, this means that initiation of a contract change order will automatically update appropriate budgets and that changing estimates of cost-to-complete for a subcontract can automatically update the forecasted cost-to-complete of an entire project. "When data is entered into the system, it becomes immediately available to all users," he added.

Centrak has a password security system that allows the manager to define who may have access to what data and even what kind of access, he continued.

The 10 Centrak subsystems that share the common data base are budget/funding; scheduling/resource allocation; task detailing; procurement; real estate; change order; contract payment; force account; system reporting; and system maintenance.

To satisfy the requirements for integration and information transfer, data is linked using a logical, hierarchical coding structure. Every piece of cost accounting information is tied to the coding structure, which reflects three different dimensions: physical work structure, such as project; responsibility structure; and source of funds.

Hennig explained that this classification scheme and the different levels of detail afforded every piece of information enables a broad range of reports to be produced for every participant involved with the capital program development.

Restore Systems Target IBM VM Environments

DANVILLE, Calif. — Calview Management, Inc. has introduced two software products for IBM VM installations.

The Backup Restore System (BRS-VM) is said to allow on-line backup and recovery of CMS files in the VM environment. BRS-VM employs an installation-based approach to the backup process that offers increased security and management control, according to the vendor.

The Archive Restore System (ARS-VM) manages the archiving of CMS files in VM environments. It reportedly enables an installation to implement an archival process for VM on a systemwide basis. Restoration of archived files may be initiated on-line by end users without the help of support personnel, the vendor claimed.

BRS-VM and ARS-VM cost $8,000 each or can be purchased together for $12,000 from Calview Management, Suite 378, 560 S. Hartz Ave., Danville, Calif. 94526.

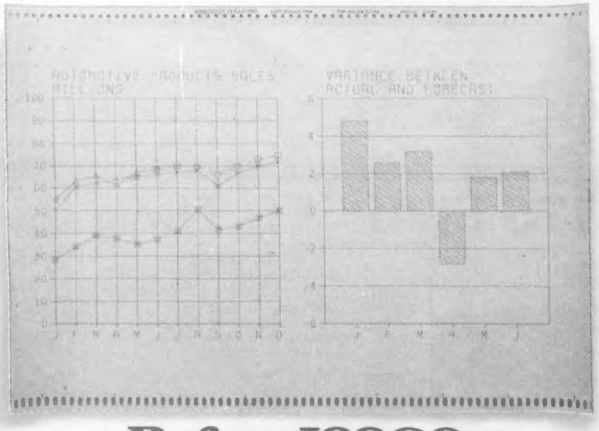
SCA Upgrades DCR for IBM

HERNDON, Va. — Software Corp. of America (SCA) has upgraded its Data Check Recovery (DCR) system to support IBM's MVS/Extended Architecture.

DCR is a utility software system that recovers data that has become unreadable due to a permanent I/O error.

DCR is available for $2,950 per CPU or $4,900 for a site license for installations with two or more processors. SCA is located at 455 Carlisle Drive, Herndon, Va. 22070.

Wait 'til management sees is doing to the



Before ISSCO

With ISSCO graphics software your computers can produce artist-quality charts and graphs. No more fuzzy letters and frazzled images. ISSCO computer graphics are always sharp and clear. What's more, you'll enjoy layout freedom and can choose from a variety of graphic enhancements that let you tailor a chart exactly to your needs.

ISSCO software is especially useful for management presentations. It lets you access data directly from your computers and reproduce it on paper, overhead transparencies or 35mm slides. And you'll always get professional results.

Honeywell Adds Interactive Data Base Package

WALTHAM, Mass. — Honeywell, Inc. has announced an on-line interactive data base package for point-of-business use by distributors. The package was designed for use with the firm's DPS 6 and Level 6 lines of small systems.

Called HDS/6 (Honeywell Distribution System), the package will be marketed to distributors in the electrical apparatus and equipment, construction materials, plumbing and heating equipment and supplies, warm air heating and air conditioning, refrigeration and industrial supply businesses.

Modules available with the package include management information, order entry and invoicing, purchasing and receiving, accounts receivable, pricing, administration/security, inventory management, sales analysis, general ledger and accounts payable and physical inventory, the vendor said.

The package costs $59,500 for a one-time license fee. An entry-level HDS/6 running under the company's Gcos MOD 400 operating system can be used on a minimum-configuration DPS 6 processor with 1M byte of main memory, a CRT terminal, remote printer, disk drive and a Model 400 Transaction Processing System 6 and sort utility.

More information is available from Honeywell at 200 Smith St., Waltham, Mass. 02154.

System Supports On-Line Output Reports

ROCKVILLE CENTER, N.Y. — An on-line output report management system has been introduced by RSD America, Inc.

Writer Scanning Facility (WSF2), is designed for IBM's 370, 30 series and 4300 series computers running under IBM's MVS or VS1 operating systems, according to the vendor. It reportedly requires no system modifications.

WSF2, RSD said, will automate and suppress manual checking of control lists, paper handling, report distribution and printout lags. It also provides automatic checking of system output or user-defined outputs for exception conditions, instant on-line access to all outputs including errors, security and confidentiality.

The package is available for $25,000. Further information is available from RSD America, Suite 402, E. Building, 100 Merrick Road, Rockville Center, N.Y. 11570.

'Bams' Handles Bidding, Procurement Applications

GAINESVILLE, Fla. — Info Tech, Inc. has announced the Bid Analysis and Management System (Bams) for use with the IBM MVS operating system with TSO and IBM VM/CMS environments.

The package is a decision support system that integrates data management, reporting, analysis and graphics. The package was designed for procurement and bidding applications, the vendor said.

Information covering the contracting process, from planning and estimation through contract completion is accessable via the Bams package. The information can be used for analysis, graphics output and reports. Other features include automated proposal generation, cost estimation, bid tab generation, vendor qualification and market performance evaluation, the vendor said.

Also included in the Bams package are tools to develop and maintain historical data, application/analysis programs and a menu-oriented user interface.

The package costs $75,000 including consulting, installation support and product training from Info Tech through P.O. Box 14545, Gainesville, Fla. 32604.

'Docu/Master' Gets Update

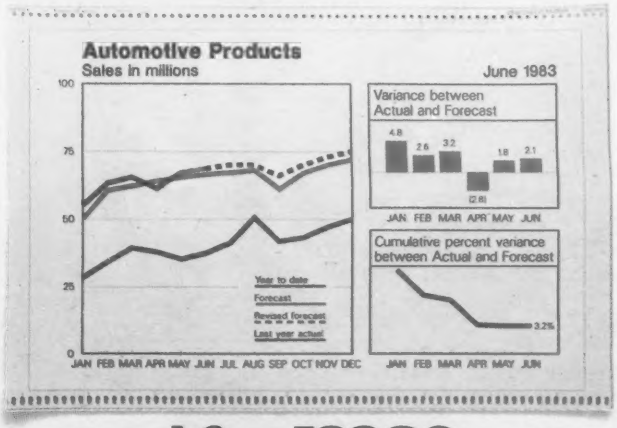
NORWALK, Conn. — A new release of its document storage and retrieval system for IBM mainframes has been announced by TSI International, the systems software company of Dun & Bradstreet, Inc.

Release 2.2 of Docu/Master adds several foreign language options and enhancements to the system's search capabilities. A separate standard language is allowed for each terminal defined in the system, while command language, system responses and error messages have been translated to French and German.

Docu/Master runs on IBM 360, 370, 30 series, 4300 series or compatible mainframes under IBM's DOS/VSE, VS1 and MVS operating systems and requires a minimum 90K bytes of memory.

Prices for basic systems start at $32,200, and term contracts are available. TSI International is located at 187 Danbury Road, Wilton, Conn. 06897.

what the D.P. department company's image.



After ISSCO

Isn't it time you got the credit for making the company look good? For more information about artist-quality graphics and a free copy of our 40-page manual, "Choosing the Right Graphics Devices," write ISSCO, 10505 Sorrento Valley Road, San Diego, CA 92121. Or call (619) 452-0170.

ISSCO GRAPHICS SOFTWARE

Draw faster conclusions with ISSCO

Productivity Tools Can Ease Managers' Burden

(Continued from Page 53)

of sales tax, investment tax credits, depreciation and amortization and current and projected future market values.

Managers should be aware of the wide range of performance related to the system software products available.

They should also be aware of the hidden costs involved in hardware upgrades and the need to modify the computer room and the current software to take full advantage of new hardware equipment.

Personnel. Believe it or not, the DP department is one of the most labor-intensive operations around. The computer itself is dependent on constant human intervention in the flow of jobs being processed. When preparing budgets to handle increased work loads, DP managers should pay attention to using cost-effective operations management software.

Careful attention should also be paid to program development. A major part of the programming function is clerical.

The processes of coding, debugging, documentation and maintenance could be made more productive if the right software tools were made available to the programmers.

A large portion of DP resources are also committed to servicing end-user requests for information. By giving these departments the means to service their own requests through advanced software tools, such as interactive user-friendly query languages and nonprocedural applications development systems, the DP labor cost can be significantly reduced.

Maintenance. A DP manager must know the terms of maintenance contracts, standard and overtime service arrangements, whether servicing was performed for bills received, when it will be needed in the future and whether it should be done by an independent servicing bureau. Financial planning and modeling systems are needed to do the time-consuming reconciliation of bills for service, to keep track of the terms of maintenance agreements and to model various options.

Software. Although most installations use packaged systems software, they still do an inordinate amount of their own applications development work.

While direct costs are relatively easy to estimate, indirect costs are more difficult to assess, as the following questions illustrate:

- To what extent does development impact production work on the computer?
- What proportion of the hardware costs are allocated to nonproductive development?
- What percentage of the development resource is allocated to maintenance?
- To what extent does production software that has not been kept current with the hardware impact the performance of the computer?
- How is productivity reduced through production reruns, and are systems crashes due to inadequately tested or designed in-house software?
- How is maintenance impacted by badly designed or documented software?
- How is productivity of in-house development impacted by the salary levels paid, quality and quantity of staff and rate of turnover?

Computer Supplies/Environment. To determine its actual profitability, the DP center should be set up as a profit/cost center and charged for environmental overhead.

The DP manager should have access to a comprehensive job accounting/performance measurement product that monitors productivity over shift, day, week, month or any desired period.

Some packages collect data on overall system utilization and performance to help determine the effectiveness of the system's hardware and software configuration for the present work load and project trends for future periods.

This information can be used to project future costs, eliminate inefficiencies and provide justification for acquiring or discontinuing equipment or software.

Some products can actually optimize code, identify hidden and untested logic errors and provide debugging information.

Others include debuggers that shorten the testing and debugging cycle and produce more reliable programs.

Then there are powerful information processing tools with unlimited file-handling capabilities. They can generate an unlimited number of reports with a single pass of the input file and reduce report generation times by nearly 80%.

Project management products can help data center managers stay on budget by deploying the proper mix of programming resources to meet project deadlines.

In this way, the DP center is not just providing automation at a reduced cost.

The professional management of the DP center and its contribution to the company are more clearly demonstrated.

Wang is president of Computer Associates International, Inc.

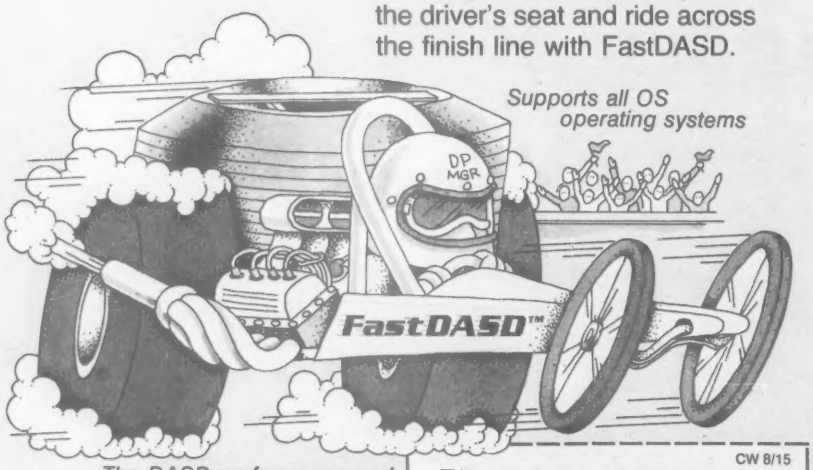
- **Migrating to new devices?**
- **Moving to a new machine?**
- **Having performance problems with your DBMS?**
- **Reorganizing data sets?**

FastDASD™ improves performance of your DBMS.

If the answer to any of the above questions is yes, find out today why hundreds of other companies are buying FastDASD . . . the DASD performance and reporting system.

Take charge of your DASD performance problems—get in the driver's seat and ride across the finish line with FastDASD.

Supports all OS operating systems



The DASD performance and reporting system

CALL

703-471-1545

for an Information Pack on how to "TEST DRIVE" FastDASD for 30 days, or fill out the coupon at right. See for yourself why FastDASD is your DASD's best friend!

SOFTWARE CORPORATION OF AMERICA

455 Carlisle Drive • Herndon, VA 22070

CW 8/15

☐ Yes, send me more information on improving performance with FastDASD.

Software Corporation of America
455 Carlisle Drive • Herndon, VA 22070
703-471-1545

Name _____

Title _____

Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

OP SYS____ CPU____ #DASD spindles____

For Distribution Plans

'Logic' Finds Lowest Cost

TORONTO — A distribution logistics optimization software program for finding lowest cost physical distribution plans is now available from Numetrix Ltd.

The new program, Logic, is part of Numetrix' integrated decision support system, Result. Numetrix said the program enables managers and planners to evaluate, using a screen terminal or IBM Personal Computer linked to a mainframe, various strategic distribution alternatives or automatically select an optimum distribution policy based on geographic supply and demand and related transportation costs. It is applicable to fleet composition studies, location selection, distribution network planning and distribution problems.

A part of the Result integrated decision support system developed by Numetrix, Logic may be accessed through the Numetrix Time-Sharing Service at standard rates and is available in bundled mode with Result for in-house installation on IBM, Digital Equipment Corp. and other mainframe computers for a monthly license fee of $1,125. Numetrix is located at 5th Floor, 3 Church St., Toronto, Ontario M5E 1M2.

PE's 'Debug/32' Tests, Verifies Fortran VII

OCEANPORT, N.J. — Perkin-Elmer Corp. has introduced a symbolic debugger that is said to allow a programmer interactively to test and verify the operation of application programs using the Fortran language.

Debug/32 provides full source-level debugging of Fortran VII programs using the same variables, labels and other constructs of the original Fortran source, the vendor said. In addition, the debugger interpretively executes Fortran VII assignments and IF and CALL statements providing full Fortran syntax and semantics, according to the vendor.

This product is priced separately at $2,000. It is also available with the company's Universal Fortran language system ($15,000) and the Global Fortran language system ($10,300). PE can be reached at 2 Crescent Place, Oceanport, N.J. 07757.

ATI Releases Training Kit For Dbase II

MANHATTAN BEACH, Calif. — American Training International, Inc. (ATI) has released training software for Ashton-Tate's Dbase II and BPI Systems, Inc.'s General Accounting software for personal computers.

The training packages use interactive disks that simulate the software and lead the user step by step in the use of the software.

Volume 1 of the training software for Dbase II instructs the user in how to set up a data base file, according to the vendor.

Volume 2 of Dbase II deals with the program that acts on the data base file, specifically: menu, data entry, printing customized forms, generating reports of indexed information and printing mailing labels, according to the vendor.

Each volume is available separately for $39.95 each, or both for $75.

The training software for BPI General Accounting is designed to teach users how to master a program to help small businesses manage their financial information. The package costs $75.

American Training International can be reached at Suite 201, 3770 Highland Ave., Manhattan Beach, Calif. 90266.

SHIPPING NOW!
SAS* USERS UPDATE!
"USING SAS"(82)
ANOTHER CAI COURSE WRITTEN BY GARY DEWARD BROWN
FROM CRWTH
The Information Center People
800-282-2372
INSIDE CALIF. (213) 391-6788
Company _____ My need is
Name/Title _____ ☐ Immediate
Address _____ ☐ 1-3 Months
Phone _____ ☐ Future
CRWTH COMPUTER COURSEWARES • 613 Wilshire Blvd. •200 • Santa Monica, CA 90401

SERIX™
High Performance UNIX™ for the IBM Series/1.

SERIX provides lower software costs plus these outstanding advantages:

A long term avenue for growth
- AT&T licensed UNIX — The Coming Standard
- Software portability
- Access to a large, growing software base
- Real-time extensions

Increased programmer productivity
- Programmer's workbench
- Large set of utilities
- Hierarchical file structure
- Synchronous, asynchronous and delayed processes

Delivers more power from the Series/1
- Optimizing C compiler uses native code features
- All code reentrant
- Swapping — multiple concurrent users
- Addresses the full megabyte of memory on the 4956 processor
- Disk interleaving capability

Included subsystems:
- Networking
- Electronic Mail
- Word Processing
- Resource Accounting

Optional systems:
- COBOL and other languages
- EDX-to-SERIX conversion package
- Database
- Spreadsheet
- SNA Communication
- The vi visual editor

CMI Corporation is an IBM Master VAR. Leasing and other financial arrangements available.
Contact CMI for more information:

CMI Since 1969 A Torchmark Company Member CDLA
CMI CORPORATION
755 W. Big Beaver, 19th Floor, Troy, MI 48084
TWX/TELEX: 810-232-1667 CMI CORP TRMI
(313) 362-1000

UNIX is a trademark of AT&T. SERIX was developed by COSI exclusively for CMI.

For Engineering Analysis

Scada Program Supports DEC Systems

LOS ANGELES — American Computers & Engineers has introduced an engineering analysis program for users of Digital Equipment Corp.'s Rainbow, PC-350, VAX-11 and PDP-11 computers.

The Structural Computer-Aided Design and Analysis (Scada) program will reportedly analyze any size structure, including shear walls and slabs. It plots structures in high resolution with or without deflection, the vendor said. The product reportedly can carry model analysis, time history, response spectrum, base motion analysis and design concrete or steel beams and columns.

Written in Fortran, Scada is designed to run under Digital Research, Inc.'s CP/M operating system, and under DEC's VMS, RSX-11M and P/OS operating systems.

The package lists for $9,100, the vendor said from Suite 204, 2001 S. Barrington Ave., Los Angeles, Calif. 90025.

Accounting Package Fits Series 1

PALO ALTO, Calif. — Remote Computing Corp. has announced an accounts payable package for the IBM Series/1 computer under Pick & Associates, Inc.'s Pick operating system.

Features include on-line storage of invoices and checks, automatic payment of recurring bills and contracts as due, automatic account and cost center distributions and custom management reports.

The package reportedly can be fully integrated with financial systems from Priority Plus Corp., including general ledger, scheduled amortizations, construction loan control, loan origination and tracking and personnel management.

The accounts payable system costs $4,000 from Remote Computing at 1076 E. Meadow Circle, Palo Alto, Calif. 94303.

SYSTEMS 83

Computer and Communication

8th International Trade Fair and International User Congress

17 - 21 October

Munich - Trade Fair Centre

- International Trade Fair for the EDP and Software Industry (more than 700 firms)
- International Seminars on EDP Application

Coupon SYSTEMS 83

Please submit detailed information on

☐ Trade Fair ☐ User Congress

Name _____

Address _____

US-Representative:
Gerald G. Kallman Associates, 5 Maple Court, Ridgewood, New Jersey 07450, Tel. (201) 652-7070

RTfile DBMS Available for VAX-11

BETHESDA, Md. — Contel Information Systems, Inc. has announced that its RTfile data base management system (DBMS) is now available under the VMS operating system for all of Digital Equipment Corp.'s VAX-11 minicomputers.

RTfile is an interactive fourth-generation relational DBMS for users of DEC's LSI-11, PDP-11 and VAX computer systems. The system provides menu-driven, forms-oriented utilities which enable end users to perform a wide range of commonly needed DP tasks without programming.

Depending on options, RTfile costs between $4,500 and $9,500 from Contel at 4330 East-West Highway, Bethesda, Md. 20814.

Accounting System Tailored to VAX-11

SAN ANTONIO, Texas — Plycom Services, Inc. has an Accounts Payable System designed to work on any Digital Equipment Corp. VAX-11 computer running the VMS operating system.

Features are said to include menus, batch entry of invoices, on-line maintenance of transactions and master files, accounting period orientation and automated period and year-end closing procedures.

Designed to handle a multidivision or multicompany corporate structure, the software features a query program and several informational reports. It automatically produces expense and disbursement entries for the general ledger.

Written in VAX Basic, the software is priced from $7,500, according to Plycom Services at Suite 150, 4243 Piedras E., San Antonio, Texas 78228.

'Adli' Backs File Conversion

FORT WAYNE, Ind. — Conversion Systems, Inc. (CSI) has announced Adli, a product which allows NCR-Comten, Inc. Amigos files to be converted either to Vsam or IBM DL/1 files without affecting application programs.

The product is designed to ease the task of converting to a new data base management system or teleprocessing monitor, a spokesman said.

Adli does not require any source code conversion or recompilation of existing applications. The interface software does not restrict the user's application language, file structure or data format.

The operation of Adli is transparent to the user and the application programs. Once Adli is installed, IBM's IMS can be used immediately without the need to change applications. Conversion can take place as part of the normal program maintenance cycle, the vendor said.

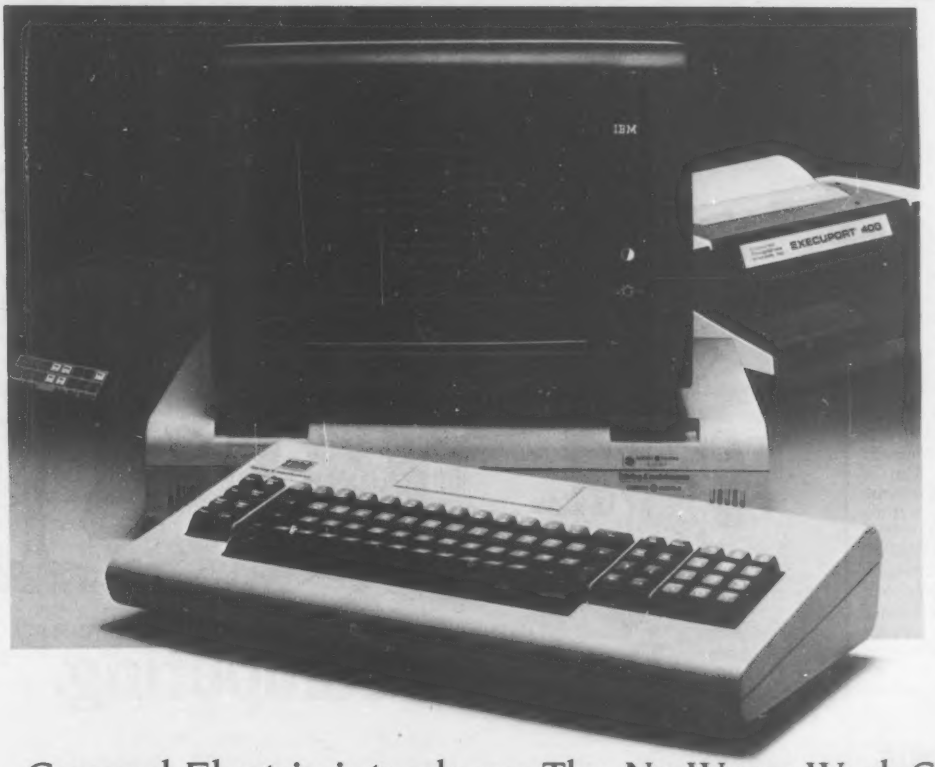
Adli costs $20,000 for OS and $25,000 for DOS operating systems from CSI, 3442 Stellhorn Road, Fort Wayne, Ind. 46815.

Don't worry. Call the sales location nearest you.

Atlanta (404) 452-4926
Baltimore (301) 332-4710
Birmingham (800) 241-2335
Boston (617) 938-1920
Charlotte (704) 525-0311
Chicago (312) 780-2994
Cincinnati (513) 874-8512/15
Cleveland (216) 441-6111
Dallas (214) 243-1106
Davenport (319) 285-7501
Decatur (217) 424-8495
Denver (303) 320-3250
Detroit (313) 285-6700
Evansville (812) 473-6161
Fort Wayne (219) 482-4506
Houston (713) 672-3575
Indianapolis (317) 241-9330
Jacksonville (904) 751-0615
Kansas City (816) 231-6362
Los Angeles (213) 642-5317
Louisville (502) 452-3311
Memphis (800) 241-2335
Miami (305) 940-7723
Milwaukee (414) 744-0110
Minneapolis (612) 522-4396
Mobile (205) 479-6547
New Orleans (504) 367-6528/29
New York (201) 227-7900 (212) 349-2687
Philadelphia (215) 923-0383 (609) 488-0244
Phoenix (602) 278-8515
Pittsburgh (412) 464-5470
Richmond (804) 743-8181/82
St. Louis (314) 993-0537
Salt Lake City (801) 973-2253
San Francisco (415) 436-6622
Schenectady (518) 385-0398
Seattle (206) 575-2987/88
Southington (203) 621-4059
Syracuse (315) 456-1564
Tucson (602) 294-3139

GENERAL ELECTRIC

What, you worry?



A typical combination of quality and value:

IBM 3101/20 CRT • detachable keyboard • hi-resolution display • 110-9600 bps • 25th status line

Racal-Vadic 212 PA Modem • 1200/300 Bell 212A/103 compatible • Auto dialer • 15 telephone number memory • user-programmable options

(Optional) CTSI/Execuport Impact Printer—30 cps • 80 column • 2K buffer • uses plain paper

Prices: For Modem and CRT, just $99* a month for one year lease. With printer $139* a month.

General Electric introduces The No-Worry Work Station. Picked from among the best equipment in the business. Backed by service you'd expect from GE.

You have enough on your mind without worrying about your work stations. That's why we've put together a combination of tension relievers we challenge *anybody* to match.

No worry about what. We screen the new technology to make sure we offer the most desirable choices in a category. Then customize the station to you.

No worry about when. From our nationwide service network, we can usually respond to your problems within 8 business hours in most continental U.S. locations. That really pays off when you *need* service.

No worry about who. GE has both the technical and financial resources that mean *security*—now and in years to come.

No worry about how much. We are competitively priced. And all things considered, we feel the best *value* in the business—whether for leasing, purchase or whatever arrangement you prefer.

Why worry—when you could call now. The number's (800) 528-6050, Ext. 406. (In Arizona, call 800-352-0458, Extension 406.) For the number of the sales location nearest you, check the adjacent column.

Or write, General Electric Company, Communication Leasing and Service, Building 4, Room 210, Schenectady, New York 12345.

*Installation and F.O.B. shipment not included. All orders subject to credit approval. Offer limited to commercial users. Offer expires Friday, September 9, 1983.

GENERAL ELECTRIC

For Honeywell's DPS 6

Fixed Assets Package Offered

PHOENIX — A fixed assets software package for the Honeywell, Inc. Level 6/DPS 6 minicomputer has been introduced by Independent Computer Systems, Inc.

The fixed assets package is said to provide for all generally accepted depreciation methods and to maintain depreciation on a tax and book basis. The system is on-line, menu-driven and designed to be used by non-DPers, according to a spokesman for the vendor. It features 14 depreciation methods, asset transfers and retirements, depreciation forecasting and method change analysis, the spokesman said.

The software requires Honeywell's Gcos MOD400 operating system, Vdam and 40K bytes of memory per terminal.

A one-time license fee is $16,000 from Independent Computer Systems at 8686 N. Central, Phoenix, Ariz. 85020.

MCBA Unveils 'G/L' Release In Cobol for Wang VS Line

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has announced a release of its General Ledger (G/L) package written in Cobol for the Wang Laboratories, Inc. VS family of computers.

Release 3 is said to feature multi-company capabilities and an expanded user-defined G/L account number allowing as many as 21 characters in up to five levels. The release allows the user to define interactively financial entities, grouping up to 36 ranges of profit and cost centers into each financial entity, according to a spokesman for the vendor.

The release costs $2,000 to $6,000 for source code for the first computer, depending on VS model. MCBA is headquartered at 2441 Honolulu Ave., Montrose, Calif. 91020.

DEC VAX Users Get 'CJ/Payroll'

TAMPA, Fla. — Collier-Jackson, Inc.'s payroll processing and reporting package is now available on Digital Equipment Corp.'s VAX-11 family of 32-bit minicomputers.

CJ/Payroll is a data-base-oriented, on-line, menu-driven software package said to provide automatic processing from time transactions through general ledger updating.

The software accommodates multiple companies, divisions and departments as well as single entities. System customization is achieved through master files, data tables and logic controls.

A $16,000 license fee includes object code, source code, training at the user's facility, installation, documentation and 90-day support. Collier-Jackson is headquartered at 5406 Hoover Blvd., Tampa, Fla. 33614.

'Update' Added To Data Base On Remote Net

EL SEGUNDO, Calif. — Computer Sciences Corp. (CSC) has added a load and update processor to the Manage data base system available on its Infonet remote computing network.

Called Update, the new package allows an Infonet customer to use English-like commands to load or change single or multiple records and values throughout a complex data base structure, the company claimed. Users previously had to load and update their data bases with Fortran or Cobol programs written for that purpose.

Update's language is modeled after the Manage inquiry and report writing language, a spokesman said. No special charges are associated with the use of Manage or Update. Costs are determined by Infonet resources used.

CSC is located at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

'EZM' Processor, Plotting Package Out for 'Domain'

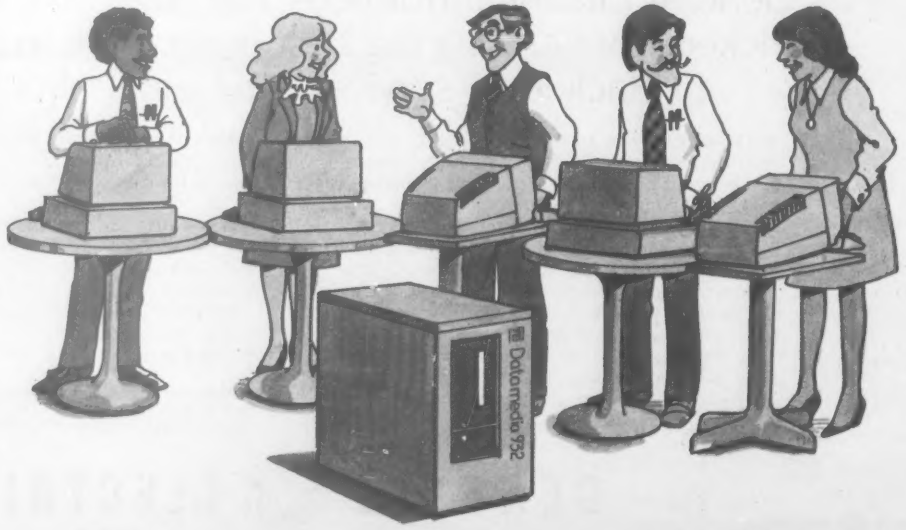
WELLESLEY, Mass. — DLB Computer Systems, Inc. has introduced an integrated business/financial time-series processor and graphics program with mainframe capabilities for Apollo Computer, Inc.'s Domain system.

Easymodeler (EZM), with over 20,000 lines of source code, is said to allow the manipulation of such data as corporate financial statistics, securities market price and volume data, production statistics and government indexes, a vendor spokesman said.

Integrated with EZM is a plotting package that produces graphs of projected data. The package can be configured to access user data bases created with Apollo's D3M Domain Distributed Data Base Management System.

EZM costs $2,500 per Domain node, DLB said from 1 Hollis St., Wellesley, Mass. 02181.

Personal computing.



Departmental computing.

DEC Minis Get MS-DOS

BERKELEY, Calif. — Virtual Microsystems has introduced Microsoft, Inc. MS-DOS operating system capability to users of Digital Equipment Corp. minicomputers.

The MS-DOS Bridge System is an integrated hardware/software 16-bit virtual microcomputer that offers centralized microcomputing capability when used with DEC's Unibus machines, according to the vendor. Any terminal or processor attached to the minicomputer can reportedly run jobs in the host environment, which will functionally attach that user to a 16-bit personal computer. Instead of using floppy disks, the user of the virtual machine specifies virtual floppies to be attached for the current work session.

The MS-DOS Bridge System is priced at $6,500 from Virtual Microsystems at Suite 720, 2150 Shattuck Ave., Berkeley, Calif. 94704.

Graphics Package Fits DEC

MINNEAPOLIS, Minn. — Saturn Systems, Inc. has announced Saturn-Graph, a business graphics software package for users of Digital Equipment Corp. RT-11/TSX, RSX, RSTS and VMS operating systems.

The package can be used as either an add-on to the firm's Saturn-Calc package or as a stand-alone package. It allows the user to create bar graphs, line graphs or pie charts. As a stand-alone package, Saturn-Graph can produce a variety of type styles as well as other graph types, including histograms and three-dimensional charts, the vendor said.

The Saturn-Graph package costs $489 for the add-on version and $978 for the stand-alone package. Saturn Systems is located at No. 218, 6875 Washington Ave. S., Minneapolis, Minn. 55435.

Wang VS-Compatible Software Package Controls Inventory for Oil Companies

CORAL GABLES, Fla. — Business Computer Solutions, Inc. has introduced a Wang Laboratories, Inc. VS-compatible business management system software package for oil companies.

Oil Company Inventory Control Log is said to be a menu-driven, user-friendly set of seven systems: inventory control, accounts payable, accounts receivable, order entry, general ledger, payroll and fixed asset accounting. The first four modules listed are designed according to Federal Accounting Standards Board recommendations.

Prices start at $20,000, depending on hardware, extent of networking and what is supported. Business Computer Solutions is located at 2655 LeJeune Road, Coral Gables, Fla. 33134.

Control System For Micros Boasts 40 Modules

STAMFORD, Conn. — Synergistic Systems, Inc. has announced the availability of its Manufacturing Inventory™ Control System which reportedly runs on small business systems and microcomputers that support Ryan-McFarland, Inc. Cobol.

The package is said to be a collection of more than 40 functional and report modules including multilevel bills of material explosion, implosion and "what if" processing for Nohalt, Wicat Systems, Inc., Altos Computer Systems, Inc., Northstar Computer, Inc. and Molecular Logic Corp. equipment.

The system reportedly is menu-driven with data entry checking. It creates and maintains data and status information for the inventory, open and closed jobs, shortages and a detailed transaction history for audit purposes. For each part, the last six prices are retained and options for Lifo, Fifo and average accounting methods are supported.

The Cobol-80 version runs in 64K bytes under Digital Research, Inc.'s CP/M, while the multiuser version, written in Ryan-McFarland Cobol, utilizes multiple-key files for sorting versatility and record lock-out to protect data in a multiuser environment. Both versions require a hard disk (1M-byte program space) and are available only on a "semicustomized" basis.

The basic cost for either version is $2,000 plus changes and additions, a spokesman said. Synergistic Systems is located at 870 High Ridge Road, Stamford, Conn. 06905.

A person can perform wonders with a personal computer. But with two or more people using it, the computer becomes the instrument of a tug-of-war, creating bigger business problems than the ones it was expected to solve. Add more personal computers – even network them – and the costs and the problems continue to grow.

If you're planning your first step into office automation, you can sidestep problems like these and many more with a Datamedia 932 System.™ If it's too late to sidestep them, a 932 can help you solve them.

The Datamedia 932 is a *departmental* computer system. A system that's simultaneously shared by its users.

With it, up to 16 people can perform whatever computing work they have, however diverse, whenever they wish, each using his or her own workstation.

This extraordinary performance is made possible by the 932's powerful, multi-tasking, 32-bit central processing unit. And by its relational data base management software – the most powerful DBMS in the minicomputer industry, and the first of its kind in a microcomputer system.

The data base management system is fully integrated with the 932's operating system. This makes the operating system very easy to use, and makes it possible for users to share data files rather than compete for them or maintain independent files.

Because the users share data, there are no data access barriers for them to contend with. No inconsistencies in output that are often attributable to differing data files. And because incoming data are recorded by the controlling user or department, there's no need for duplication by others who can access it.

No matter what your specific requirements are, a Datamedia 932 System can be configured to meet them. It can be equipped with workstations from our broad line of color, graphics and ASCII editing terminals. Or it can accommodate the personal computers or word processors that you may already have, and let you add more workstations as your requirements grow.

As for applications, you can choose from the broadest selection of big-systems business applications software on the market. And a variety of standard software, including word processing, electronic worksheet, business graphics, and accounting, to mention a few. All perfectly compatible with your Datamedia 932 System, of course.

You can also count on receiving continued support from Datamedia, as well as from an expanding network of knowledgeable, service-minded dealers.

The Datamedia 932 System is the computing system for growing companies. For more information about it, and the location of the authorized Datamedia dealer nearest you, call 1-800-DMC-CORP. (In New Jersey, call 1-609-665-5400.) Or write Datamedia Corporation, 7401 Central Highway, Pennsauken, NJ 08109.

DATAMEDIA

Getting Business Computing Together.

'Well, There Is One Opening . . . I'm Looking for a Rich Partner.'

Micronotes

Retail Solutions, Inc. has announced a multiuser, multitasking operating system for the IBM Personal Computer and Personal Computer XT. Called the **Personal Computer/Multiuser Operating System (PC/MOS)** the system was developed for use with the company's The Retailer point-of-sale, inventory control and business accounting system for retail stores. PC/MOS can support up to 16 partitions. It costs $300 from 1211 Alderwood Ave., Sunnyvale, Calif. 94086.

General Electric Information Services Co. (Geisco) has announced an agreement with Execuware, a division of Aeronca, Inc. to allow users of Geisco's Mark III teleprocessing service to obtain electronically a demonstration of Execuware software for use on their own system. An Execuclub membership costs $60 for an individual or $600 for a corporation with up to 50 users supported.

The following Execuware packages are available to Execuclub members at a 20% discount off the indicated retail price: **The Next Step**, which generates business reports and programs, $345; **Know Your Client**, which allows organization and retrieval of information on up to 400 clients, $92.95; **Real Estate Analysis Package**, which performs analysis on financial parameters concerning acquisition of property, $149.95; **Financial Analysis Package**, $92.95; and **Economic Order Quantity**, to calculate total cost and discover loss of capital by indicating when inventory levels are kept too high, $92.95.

Sextant Systems, Inc. has announced two packages for the IBM Personal Computer and Personal Computer-compatible systems running under IBM's PC-DOS, Microsoft, Inc.'s MS-DOS or Digital Research, Inc.'s CP/M 86. **Microcrypt** provides security features including file encryption, file decryption, encrypted file viewing, file encryption for data transmission and file decryption for data transmission. It costs $95.

Quill is a document preparation system which includes document sectioning, automatic table of contents, bibliographies, footnote referencing and document indexing. It sells for $249. Sextant can be contacted through P.O. Box 251, Holmdel, N.J. 07733.

Microtek, Inc. has announced two sets of utility programs for the IBM Personal Computer with a minimum of 64K bytes of memory. **Master Utilities Volume No. 1** includes the Masterspooler print spooler; Masterspooler II, which is designed to drive the parallel port of the Personal Computer: and Masterdisk, a disk emulation program. The volume retails for $49.95.

Master Utilities Volume No. 2 includes 10 program utilities: Masterdirsort for DOS directory sorting; Masterdump for graphics screen dump routines; Masterenlarge for user-defined large screen print fonts; Masterkey for redefining DOS function keys; Masterlabel for printing formats for diskette labels; Mastermenu to sort/list Basic file menus with function keys; Masterpack to compress Basic programs; Masterundelete for recovery of erased files; Masteredit, a full-screen editor; and Masterformat for formatting edited material. The full volume sells for $99.95. Both volumes are available from 4750 Viewridge Ave., San Diego, Calif. 92123.

Softech Microsystems, Inc. has announced a utility package that allows users of the University of California at San Diego's P-System operating system to access the IBM Personal Computer XT 10M-byte fixed disk and to install drives for non-IBM standard peripherals. The package costs $20 from 16885 W. Bernardo Drive, San Diego, Calif. 92127.

The Information People has announced **Organizer II - Universal Operator Interface** for microcomputers running Digital Research, Inc.'s CP/M and MP/M, IBM's PC-DOS and Microsoft, Inc.'s MS-DOS operating systems. The package is said to provide an easily understood interface between the user and various kinds of operating systems. The package retails for $149 from 443 Hudson Ave., Newark, Ohio 43055.

Hayden Software Co. has announced an **Object Relocatable Assembler for Micros (Orca/M)**, a macro assembler which is modeled on the IBM 370 macro assembler. The product features its own IBM DOS 3.3-compatible operating system, co-resident screen editor, relocatable code generator and a link editor. Orca/M costs $99.95 from 600 Suffolk St., Lowell, Mass. 01853.

Redding Group, Inc. has announced a version of its **Graftalk** graphics product for the IBM Personal Computer with Microsoft, Inc.'s MS-DOS operating system and Hewlett-Packard Co.'s 7470 plotter. Graftalk uses English-like commands to produce bar, pie, line and symbol charts, a spokesman said. The package costs $450 from 609 Main St., Ridgefield, Conn. 06877.

(Continued on Page 64)

SCIENCE/SCOPE

A Very High Speed Integrated Circuit chip has been produced at Hughes Aircraft Company, marking a significant step toward using advanced semiconductor technology in military systems. The chip, built after less than two years of development, contains 72,000 transistors in an area the size of a thumb tack. The VHSIC program is being conducted by the U.S. Department of Defense to develop chips that will give military electronic systems a tenfold increase in signal processing capability. The high-speed, compact VHSIC chips will be more reliable and will require less power than integrated circuits now in use.

A new video graphics projector that's brighter and sharper than conventional projection TV may be the next addition to office computer systems. The Hughes projector displays monochromatic computer-generated alphanumerics, symbols, and graphics. It could be used for displaying dynamic computer data and facsimile video pictures in board rooms and other areas, and for teleconferencing. The projector uses a device called a liquid-crystal light valve, a cousin of displays in digital watches. This device intensifies the image from a cathode-ray tube and projects it onto a screen up to 12 feet wide. The picture is so bright and has such high resolution that the viewing room needn't be darkened.

A uniquely shaped waveguide antenna is one of 13 patentable innovations built into the Advanced Medium-Range Air-to-Air Missile. The antenna is configured to occupy a very small space and yet provide a low-frequency-band data link to launching aircraft. Its novel shape also minimizes interference and provides a moderate amount of cross-polarization, a feature that improves communications. Hughes designed and developed AMRAAM for the U.S. Air Force and Navy.

The U.S. Navy's A-6E Intruder aircraft will carry an improved turret for its electro-optical system, which lets the aircrew see and attack surface targets shrouded by darkness, smoke, or haze. The turret, located on the aircraft's chin, is part of a combination laser and infrared device, the Hughes Detecting and Ranging Set. While the original turret allows access from the bottom, the new clamshell-like design allows quick access from both top and bottom to simplify maintenance. The design also reduces the length of flat cable in the turret by 35 feet. The new turret will be introduced in December.

"Diversification" characterizes Hughes Industrial Electronics Group, located in the Southern California communities of Carlsbad, Irvine, Newport Beach, Sylmar, and Torrance. Our facilities are like small companies with 500 to 2,500 employees, but each offers the resources and benefits of a multibillion-dollar company. Our diverse technologies include silicon and GaAs semiconductors, fiber optics, microwave and millimeter-wave communications, microprocessors, lasers, and solar cells. Send your resume to B.E. Price, Hughes Industrial Electronics Group, Dept. SE, P.O. Box 2999, Torrance, CA 90509. Equal opportunity employer.

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY

For additional information please write to: P.O. Box 11803, Marina del Rey, CA 90295

A 600 LPM built on a simple principle.

It really works.

A minimum of moving parts and an exceptionally rugged design make the CI-600 from CIE Terminals the *first* 600 LPM matrix line printer you can depend on.

And when you compare the CI-600 with other 600 LPM line printers, you'll find others either do a lot less, cost a lot more, or both.

The CI-600 is plug-in compatible with virtually every type of computer system, including IBM and DEC.® It doubles the throughput of our CI-300 at less than 30% more cost. It gives you 600 LPM data processing and letter quality to 170 LPM. It has variable shuttle speeds. And it delivers graphics up to 4800 DLPM.

The CI-600 is ideal for retail, business, engineering and scientific graphics applications, all of which are easily accessed and used. It has PLOT 10™ Graphics capability. And there's more.

You get high resolution graphics for Bar Codes, Optical Character Recognition, Form Generation, Labels and Word Processing. An unusually small print head diameter for needle-sharp character clarity. Hundreds of unique character fonts. And three built-in interfaces, two parallel and one serial.

There are also two paper-loading points—front and bottom. Plus flexible line spacing and line feed speed.

If you'd like the same quality, but don't need as much speed, we also offer the CI-300—with 300 LPM data processing and 85 LPM of letter quality.

The CI-600 and CI-300 come to you from CIE Terminals, a new company of C. Itoh Electronics, one of the world's most experienced printer companies.

To find out more about the CI-600—the *first* 600 LPM line printer that really works—and its cousin, the equally dependable CI-300, just write or call.

CIE TERMINALS

A new company of
C. ITOH ELECTRONICS, INC.

2505 McCabe Way, Irvine, CA 92714-6297. (714) 660-1421. Call toll-free 1-800-854-5959.
In California, call toll-free 1-800-432-3687.

® DEC is a Registered Trademark of Digital Equipment Corporation.
™ PLOT 10 is a Trademark of Tektronix.
© CIE Terminals, Inc. 1983

Micronotes

(Continued from Page 62)

Fisher Business Systems, Inc. has announced the **Personnel Agency Management System** for personnel agencies using the IBM Personal Computer XT and other personal computers using Microsoft, Inc.'s MS-DOS, priced at $1,500. Contact the vendor at Suite A-200, 3260 Powers Ferry Road, Atlanta, Ga. 30067.

Zenith Data Systems Corp. has released a directory listing more than 230 16-bit software programs for its Z-100 desktop computer. The directory is available for $25 from Zenith at 1000 Milwaukee Ave., Glenview, Ill. 60025.

Dynamic Microprocessor Associates, Inc. has announced **OS Converter**, a package which permits Microsoft, Inc. MS-DOS object code to run on Digital Research, Inc. CP/M 86 microcomputers and enables CP/M 86 object code to run on MS-DOS systems, reportedly without loss of speed. The product costs $95 for either operating system from 545 Fifth Ave., New York, N.Y. 10017.

VM Personal Computing, Inc. has introduced **Relay**, a communications software package for the IBM Personal Computer that allows users access to a variety of computer service bureaus and communication and data transfer to corporate mainframes. It is available for $89 from the vendor at 60 E. 42nd St., New York, N.Y. 10165.

The Business User's Solution, a set of integrated applications modules, is available from Executec Corp. for use under its Execu/Bus environmental control program. Package modules include word processing, graphics spreadsheet, communications, data management and reporter applications for the IBM Personal Computer and other personal computers. Prices range from $450, and Executec also announced distribution through Starsoft, Inc. Queries to Executec should be addressed to 12200 Park Central Drive, Dallas, Texas 75251.

Bailey and Associates, Software Publishing and Marketing Division, has introduced **DBmenu**, a menu program designed to eliminate the need for users to write and rewrite menu programs when using Ashton-Tate, Inc.'s DBase II on microcomputers running under Digital Research, Inc.'s CP/M or Musys Corp.'s Turbodos systems and the IBM Personal Computer with PC-DOS. It is available for $19.95 plus $2 shipping from the vendor at 3747 S. Harvard, Tulsa, Okla. 74135.

Intel Corp. has published the first annual **Software Yellow Pages**, a directory listing more than 2,000 of its own and independent vendors' software packages for Intel's IAPX family of microprocessors. It can be ordered free of charge by writing on business letterhead only to the vendor at Literature Department Z15, 3065 Bowers Ave., Santa Clara, Calif. 95051.

The **File Utilization Analysis System**, a software product designed to provide a nontechnical method of monitoring disk file usage and availability on the IBM System/34 minicomputer, is available for a one-time fee of $79.95 from Applied Data Processing, Inc., 10939 N.E. 49th St., Kirkland, Wash. 98033.

Data Base Manager II, a data base program for the IBM Personal Computer, has been introduced by Alpha Software Corp. and is said to integrate popular spreadsheet and word processing programs. The package is priced at $295 in retail outlets, and further information is available from the vendor at 6 New England Executive Park, Burlington, Mass. 01803.

The Software Express, Inc. has introduced **Appgen**, an automated applications generation tool, along with an array of Appgen applications packages that run under Unix and Pick and Associates, Inc.'s Pick operating systems. Appgen is priced at $12,000 and applications packages start at $1,200. Information is available from the vendor at Suite 220, 10103 Fondren, Houston, Texas 77096.

OPS-80, emulating Digital Equipment Corp.'s Decsystem 10's Tops-10 monitor, is available from Aquinas Computers Corp. through various retail and distribution outlets. OPS-80 was designed for a distributed processing network and reportedly allows each workstation to be a host, master/slave, file server and print server. Suggested retail price is $250 and further information is available from the vendor through P.O. Box 384, Monterey Park, Calif. 91745.

COMPUTER SYSTEMS SHOULD NOT DIE ON THE VINE

Terminal and computer equipment can become obsolete. Advances in design, capacity and applications are capable of making today's star performers tomorrow's wilting blooms.

Data Access customers have a built-in safeguard against obsolescence.

We offer over 100 terminal and personal computer products from manufacturers such as Hewlett Packard, Digital Equipment, Texas Instruments, Eagle Computers, Visual Technology, Rixon, Diablo and Racal Vadic, all with flexible leasing plans, which makes it easier to update equipment without major capital expenditures.

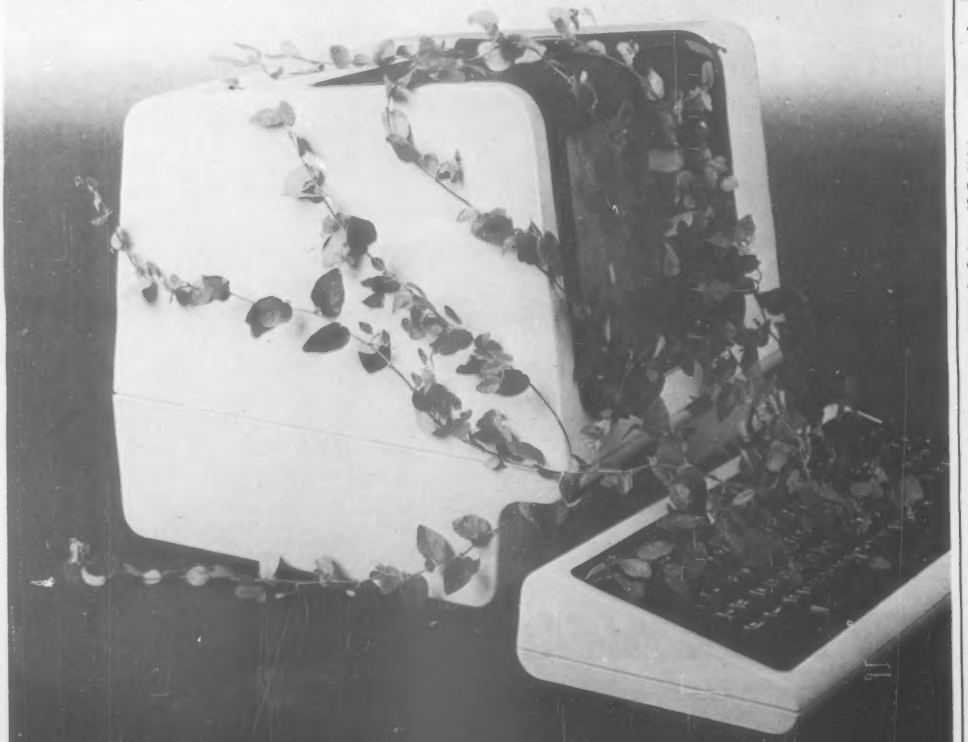
But our wide range of equipment and leasing options are just two Data Access advantages.

With Data Access you're supported by our nationwide service network in 22 cities, and a large inventory for immediate equipment delivery. From all standpoints Data Access is the intelligent alternative to your purchase, rental, leasing and service requirements.

Call today to learn firsthand why Data Access is America's largest single source for terminal and related computer equipment.

DATA ACCESS SYSTEMS, INC.

Coles Road & Camden Ave.
PO Box 1230
Blackwood, NJ 08012
(609) 228-0700 • (800) 257-7748
in New Jersey (800) 232-6510



District Offices:
Atlanta (404) 449-5436 • Boston (617) 769-6420 • Chicago (312) 967-0440 • Cleveland (216) 473-2131 • Dallas (214) 263-0252
Denver (303) 337-4103 • Houston (713) 682-5965 • Los Angeles (213) 532-2238 • Minneapolis (612) 854-4466 • New Jersey (201) 227-8880
New York City (212) 564-9301 • Philadelphia (609) 228-6660 • Phoenix (602) 254-1927 • San Francisco (415) 872-1811
Seattle (206) 251-5070 • Washington, DC (301) 459-3377

'Graphmaster 23' Builds Graphs

CHARLESTON, W. Va. — Computer Consulting Corp. has announced a software product capable of producing bar graphs for the IBM System 23 Datamaster.

The product, called Graphmaster/23, is said to be completely menu-driven, and uses a screen prompting approach to guide the user through defining, generating, storing and printing bar graphs.

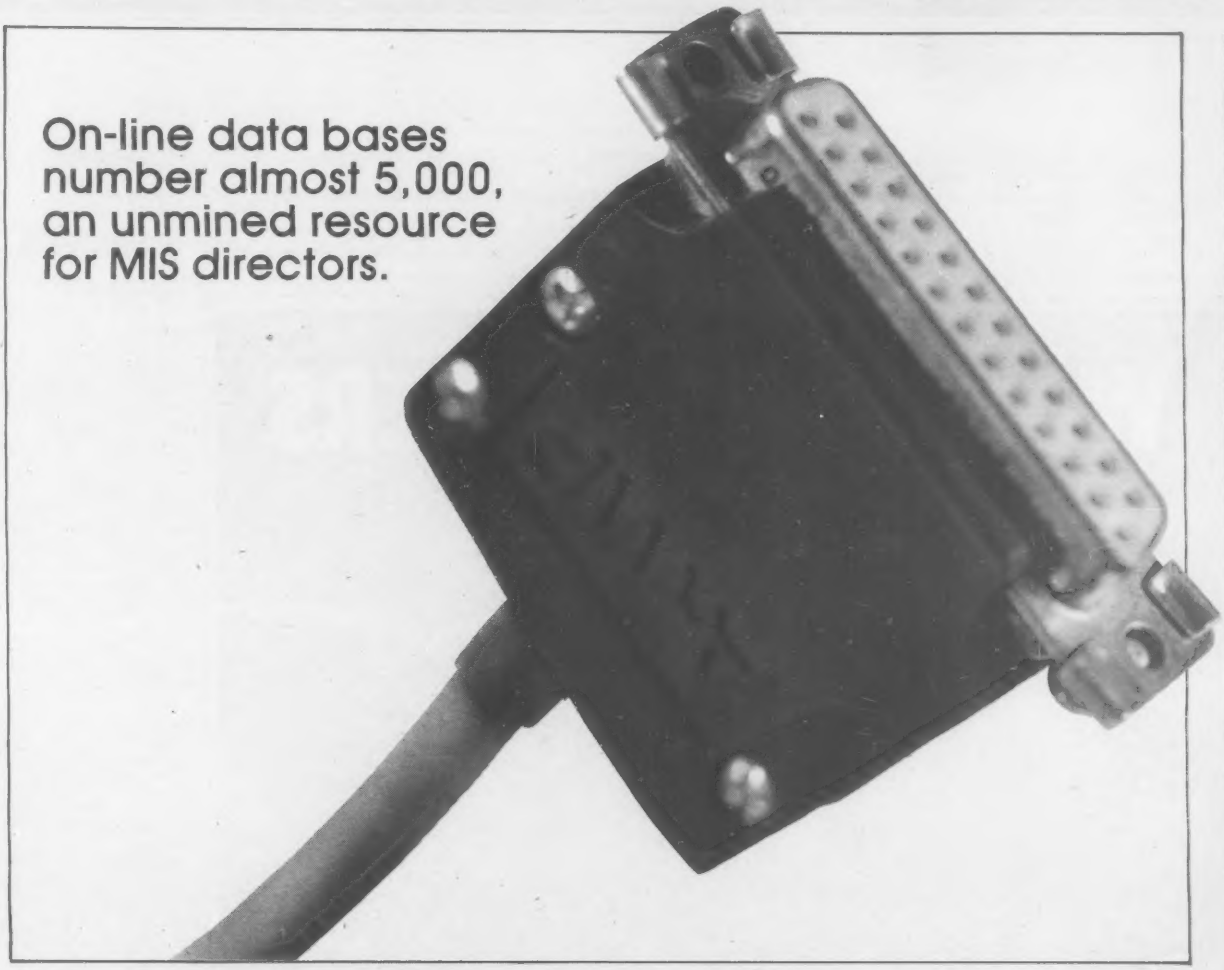
The Graphmaster/23 also retains the last generated image for every bar graph and makes it available to the user at any time for both displaying on the CRT and/or printing on the system printer, the vendor said.

The system, including help screens, on-line documentation, a manual and sample bar graphs, costs $495 for the diskette version and

Computer Consulting Corp. can be reached through P.O. Box 4407, 322 70th St. S.E., Charleston, W. Va. 25304.

'Maybe We Should Call In an Expert.'

On-line data bases number almost 5,000, an unmined resource for MIS directors.



Tapping External Data Sources

By Forest Woody Horton Jr.

Most MIS directors are so busy trying to keep up with enhancements and coping with backlogs of internal company information systems and services, they scarcely have time to discover what the newer external information resources offer.

In fact, outside resources in machine-manipulable formats and processing modes will transform the basic modus operandi of many MIS organizations over the next few years.

While hardware and software will continue to advance dramatically, the real megaindustry of the late '80s and beyond will be that sector of the broad electronic marketplace that adds value to raw data products and services. Companies in this "information industry" make data more readily accessible, understandable, usable, communicable and "intelligent." These companies do not focus on the carrier but concentrate on the content of the message itself.

This industry is redesigning and rebuilding the most complex, imaginative and productive communications/information apparatus possible with today's technologies.

Within this marketplace, many economic forces compete — the telephone companies, broadcasting systems, news media, cable companies, and satellite systems. The activities of these competitors come together in one common denominator: information content.

Among the broad classes of enterprises represented in this sector of the marketplace are the following:

Producers that acquire, edit and process information and deliver it as books, electronically accessible data bases, journals, microform collections and so forth.

Distributors that provide value-added information based on their own data bases or those of others, along with delivery services that include on-line, videotex, teletext and so forth.

Retailers that offer expert, customized access to information, whether in traditional or electronic forms.

Managers that operate clearinghouses or management information services.

Processors that provide capabilities in computer processing and communications to facilitate delivery of private and public data and information sources to users.

IN DEPTH

The proliferation of on-line publishers, products and services is dramatic. Give yourself, your colleagues or your boss a quiz.

Can you describe the products and services in the following list and name the supplier? (The answers appear in the box on In Depth/7.)

1. Dialog Information Service.
2. ABI/Inform.
3. Legi-Slate.
4. Nexis.
5. BRS/Search.
6. Dunsprint.
7. Innerline.
8. Patsearch.
9. Orbit Search Service.
10. Viewtron.
11. Compustat.
12. Psycinfo.
13. The Source.
14. Laborlaw.
15. OAG Electronic Edition.
16. Management Contents.
17. Newsnet.
18. Scisearch.
19. Magazine Index.
20. American Statistics Index.
21. X/Market.
22. Dow Jones News/Retrieval.
23. Disclosure II.
24. BI/Data.

What do companies in the information industry do? Here is a sampling:

The Dun & Bradstreet Corp. (Parsippany, N.J.) produces Duns Dial, a toll-free service to call for up-to-date Dun & Bradstreet business information, and Dunsprint, involving several report formats transmitted via high-speed customer print terminals.

Dow Jones & Co., Inc. (Princeton, N.J.) produces Dow Jones Software, a series of three investment analysis products available through retailers, designed for business and professional investors. The software allows access and manipulation of data from Dow Jones News/Retrieval.

Information Clearing House, Inc.'s (New York, N.Y.) Find/SVP Quick Information Service provides direct telephone access to an information center for quick answers to a variety of business and general questions. The service includes access to a worldwide network of SVP information centers.

Gale Research Co. (Detroit, Mich.), publisher of a large number of diversified general-purpose guides and directories, makes several of these products available as on-line data bases through Dialog Information Services, Inc. (one of the largest on-line services in the world). Gale's commercially available data bases include the

WORKING PARTNERS

Now PCs and Mainframes Share the Workload. Datalex Software Gives PCs Data Entry Capability to Pass Clean Data to Your Host Computer.

Until Datalex you've had to turn personal computers into "dumb terminals" to communicate with a mainframe.

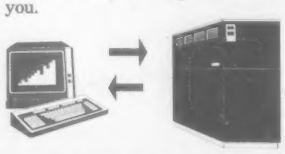
Now, data entry can be accomplished at the PC level. Then passed to a mainframe. Turning your PCs into integral units of your corporate data processing network. And freeing your host computer to work on the jobs it does best.

Get Up and Running with Entrypoint™ and Passport.™

Entrypoint is Datalex's high performance data entry software. It supports high volume, commercial grade data entry in a stand-alone or distributed environment.

Passport is our high quality, asynchronous remote communications program that provides error-free, bi-directional file transfer capabilities between most microcomputers and mini or mainframe hosts.

Together, they provide a communications link with your mainframe, batch management capabilities, high-volume capacity and an interactive screen. Which is more than any other system offers you.



And, like all Datalex software, they're available for personal computers from IBM, Digital Equipment Corporation, Hewlett-Packard, Sage, and others. And come with 90 days of installation and telephone hotline support.

All at a cost much lower than you'd expect.

For more information call Datalex at (800) 962-8888. In California, Alaska and Hawaii, call (415) 541-0780.

Yes, please put my corporation on the fast track to success. Send me more information on Entrypoint and Passport.

Name

Title Telephone

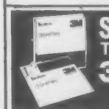
Company

Address

City State Zip

Datalex
650 Fifth Street, Suite 406
San Francisco, CA 94107

Datalex



SAVE MORE THAN EVER ON 3M Scotch DISKETTES!

$1.95 ea. Qty 20 — 5¼" SSDD (744) ← 5¼" DSDD (745) → $2.70 ea. Qty 20

5¼" SSQD—96TPI (746) $2.89 ea.
5¼" DSQD—96TPI (747) $3.95 ea.
(Specify soft. 10 or 16 sector.)

8" SSSD (740) $2.07 ea.
8" SSDD (741) $2.54 ea.
8" DSDD (743) $3.30 ea.
(Specify soft or 32 sector.)

Save even more on quantity orders!
Minimum Order 20 diskettes. Add $3.00 shipping per 200 diskettes. C.O.D. charge $1.65 additional.
Visa • Mastercard • Checks
For fast service, call
DISK WORLD!
Nationwide: 1-800-621-6827
In Illinois: 312-944-2788
DISK WORLD!
Suite 4608 • 30 East Huron Street • Chicago, Illinois 60611

Authorized Distributor
Information Processing Products
3M

Biography Master Index, Book Review Index, Encyclopedia of Associations and Research Centers Directory.

Informatics General Corp. (Dallas, Texas) responds to the information management needs of clients through such systems as its LifeComm, used in dozens of insurance companies.

International Data Corp. (Framingham, Mass.) is a market research, consulting and publishing firm that offers Data Files providing listings of worldwide computer installations; identifying multiple-unit buyers of micro- and minicomputer equipment and peripheral devices; and profiling services and software vendors and markets. IDC also publishes a series of industry newsletters in the computer/telecommunications field.

The American Psychological Association's Psycinfo (Washington, D.C.) is a source of behavioral information for the social sciences, business, law, medicine and related fields and produces such product lines as Psycinfo Database, which is available on-line through Bibliographic Retrieval Service, Data-Star, Dialog, Dimdi (in Germany) and System Development Corp.; and Psycinfo Assisted Search and Retrieval (Pasar), which permits retrospective searching and retrieval.

Times Mirror Videotex Services, Inc. (Costa Mesa, Calif.) has been heavily engaged in field trials delivering videotex service to 350 Southern California households via telephone and two-way cable. Known as Gateway, the service includes applications such as home banking, home shopping and ordering, news, games, educational programs, classified ads, electronic mail and personal calendars.

'Traditionally, MIS departments have been primarily concerned with creating internal data bases and information systems to support the large number-crunching applications such as inventory control, personnel, payroll and financial accounting.'

Information Consultants, Inc. (Washington, D.C.) offers Catalyst, a multiresource service to help subscribers design, build and maintain on-line, highly customized data bases of public or private files using menu-driven search techniques, built-in HELP messages and search commands tailored to existing vocabularies.

In the largest Fortune 1000 companies, a relatively small fraction of these kinds of information products and services is accessed. Companies are not even aware they exist.

(Continued on In Depth/8)

Announcing Fall Courses

DP Education

IMS, CICS, VSAM and FOCUS* Course Offerings

Locations
Washington, D.C.
New York City
Hartford
Atlanta
Dallas
Los Angeles

For more information, please call (203) 646-3264.

We make every bit count.

DBMI
Data Base Management, Inc.
1075 Tolland Turnpike,
Manchester, CT 06040
(203) 646-3264

*FOCUS is a trademark of Information Builders Inc.

The printer for what the world is coming to.

The more a business relies on charts, graphs, forms, diagrams and specialized characters, the more it needs a flexible and reliable computer printer.

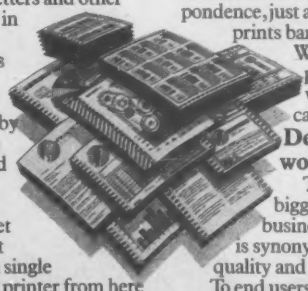
And if that business also uses bar codes and labels, it needs a printer with a brain.

The brain is built in.

Instructing the printer how to make codes can take a lot of input time from the host computer–time that it can't be used for other jobs.

Dataproducts' M-100L matrix printer has its own label-printing control board built in. It's preprogrammed to produce bar codes, block letters and other label graphics in a variety of configurations and sizes.

The board was designed by Dataproducts and is installed at the Dataproducts factory. So you get this intelligent printer from a single supplier, not a printer from here and a control board from there.



From accounting to shipping, everyone's in on this printer's act.

After the day's labels are printed, the M-100L is just getting started.

It prints reports, invoices, checks, sales charts, forms and even a lot of office correspondence, just as well as it prints bar codes and labels.

Whatever you're printing, you want a printer you can depend on.

Depend on the world leader.

To some of the biggest OEMs in the business, Dataproducts is synonymous with quality and reliability.

To end users, Dataproducts means high productivity, low cost of ownership. We're the world's largest independent manufacturer of computer printers. We build the M-100L to the same stringent standards we set for all our printers, including our most sophisticated high-speed printers. And we warrant it to OEMs a full two years–the printhead itself for one. To learn more, phone (213) 887-3924 or send the coupon below.

Dataproducts Corporation
6200 Canoga Ave., Woodland Hills, CA 91365
☐ Send details! ☐ Send a sales rep!

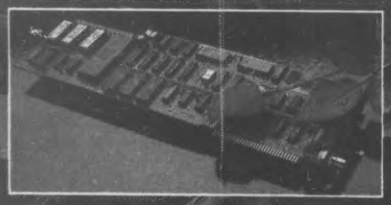
Name_____
Title_____
Company_____
Type of business_____
Address_____
City_____ State_____ Zip_____
Telephone_____ Ext._____

Dataproducts is a registered trademark. M-100L is a trademark of Dataproducts Corporation. CW/8-15

DATAPRODUCTS
The Printer Company

It was love at first sight when Charlie met IRMA, the Decision Support Interface.™ She's the first coaxial cable link between IBM Personal Computers and IBM 3270 networks—the easiest, most economical way there is to get small computers into big business.

Bouquets for IRMA.™



"Excellent—the only proved product of this kind we've seen."

Betty Feezor, Product Manager
Management Science of America, Inc. (MSA)
Atlanta, Georgia

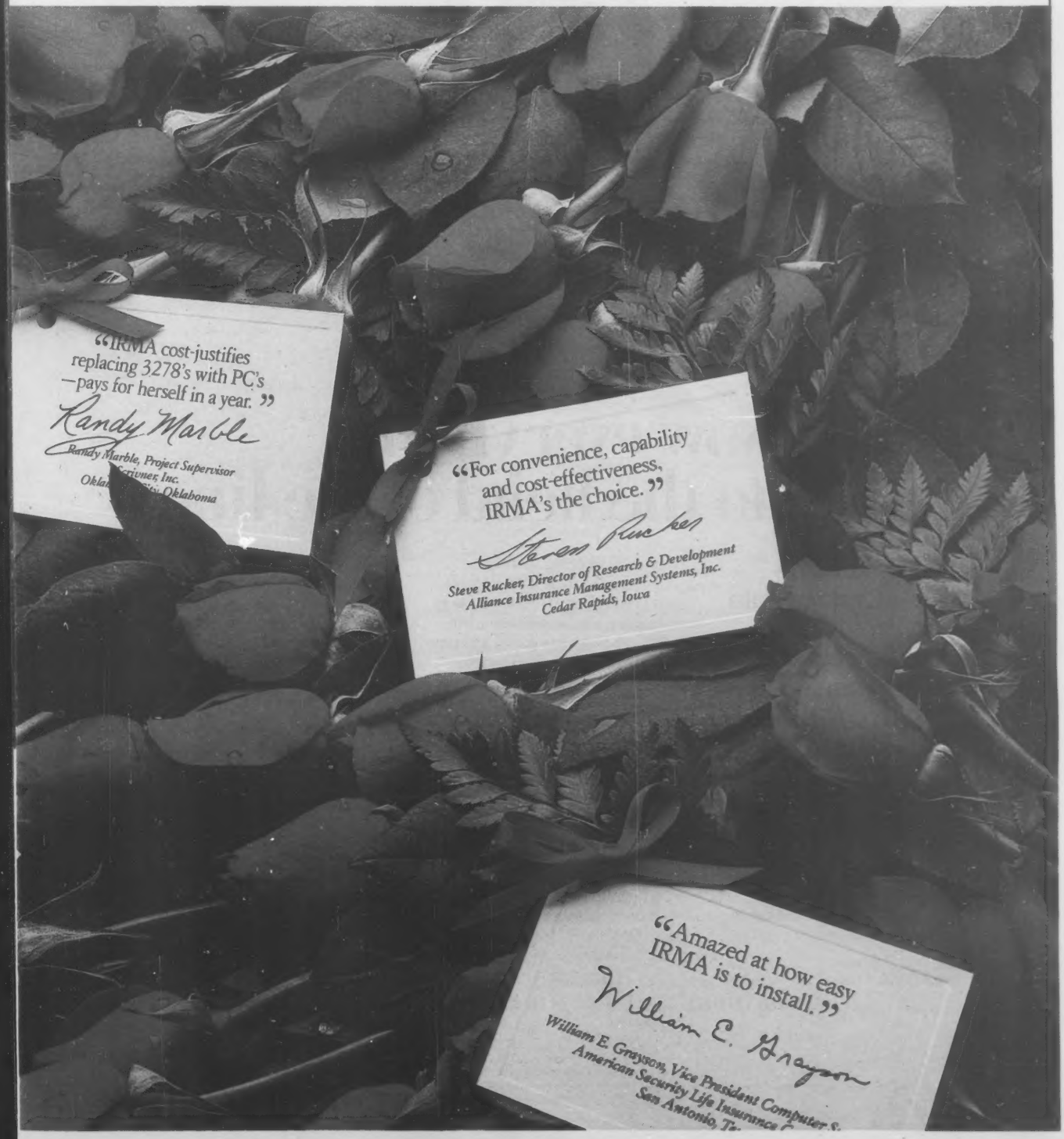
"Like IRMA's response time to the mainframe, comparable to a terminal."

George Pruett, Analyst
Federal Reserve Bank of Atlanta

"Couldn't be easier to use. Recommending her for the PC's in our company."

Robert A. Gaither, Manager Technical Support
Inland Container Corporation
Indianapolis, Indiana

Since TAC introduced IRMA in November, 1982, she's helped PC users access, store and evaluate mainframe data in thousands of installations worldwide. Read below what IRMA's admirers have to say about her. And for more information, write TAC, 120 W. Wieuca Road, NE, Atlanta, Georgia 30042. Phone (404) 252-1045, Telex 54-9600. Or you can call us toll-free 1-800-241-IRMA. **Getting computers down to business.** TAC



Now everybody can go to the head of the line.

IBM System/38 with advanced data base architecture means direct access for everyone.

It works like a large computer, yet it's a compact, easy-to-use system.

All users have direct interaction with the common data base. They share programs, data files and system resources online, and on a real-time basis.

Users can access records in various formats. For example, inventory records might be accessed by stock number for one user and by vendor number for another.

System/38 increases programmer productivity. Because it manages storage resources automatically, programmers spend less time worrying about having enough memory to execute a program, or enough room to store it. The result is that programs normally taking weeks to prepare can now be done in hours or days.

System/38 grows with you. From smallest to largest, it can quadruple its capacity.

You can readily add a variety of work stations. Up to 80 stations, including color displays, may be attached directly to the system.

Main storage grows from 1,024K to 4,096K bytes. Disk storage ranges from 64.5 to 2,672 megabytes.

The system supports RPG and COBOL. Its control language is easy to learn, and visual prompts help you specify the appropriate commands.

IBM System/38: it works like a large system.

It lets your programmers program.

And it tells users what's happening. Now.

To arrange for a free demonstration of the System/38, call your local IBM representative or *IBM Direct*'s toll-free numbers below.

IBM

Call *IBM Direct* 1 800 631-5582 Ext. 90. In Hawaii/Alaska 1 800 526-2484 Ext. 90.

A Sampling of Products and Services

PRODUCING COMPANY	PRODUCT OR SERVICE	PRODUCT OR SERVICE DESCRIPTION[1]	FREQUENCY OF UPDATE[2]
1. Dialog Information Services, Inc. Palo Alto, Calif.	Dialog	On-line access to 170 data bases from many sources on a wide variety of subjects	Varies with each data base
2. Data Courier, Inc. Louisville, Ky.	ABI/Inform	On-line access to citations and abstracts on business and management	Weekly and monthly
3. Legi-Slate, Inc. Washington, D.C.	Legi-Slate	On-line access to federal and selected state legislative information	Daily
4. Mead Data Central New York, N.Y.	Nexis	On-line access to full text from more than 50 publications and wire services	Varies with each data base
5. Bibliographic Retrieval Services Latham, N.Y.	BRS/Search	On-line access to more than 60 data bases on science, technology, business, economics and other areas	Varies with each data base
6. Dun & Bradstreet, Inc. Parsippany, N.J.	Dunsprint	On-line access to D&B financial reports on U.S. businesses	Daily
7. Bank Administration Institute Rolling Meadows, Ill.	Innerline	On-line access to banking and financial information	Varies with each data base
8. Pergamon International Information Corp. McLean, Va.	Patsearch	On-line access to U.S. patent citations and abstracts	Weekly
9. System Development Corp. Information Service Santa Monica, Calif.	Orbit Search Service	On-line access to more than 70 data bases in science, technology, business and other areas	Varies with each data base
10. Viewdata Corp. of America, Inc. Miami, Fla.	Viewtron	Videotex offering of news, data bases, entertainment and financial services	Varies with each data base or service offered
11. Standard & Poor's Corp. Englewood, Colo.	Compustat	On-line access to financial reports on U.S. and Canadian businesses and financial institutions	Weekly
12. American Psychological Association Washington, D.C.	Psycinfo	On-line access to citations and abstracts from *Psychological Abstracts*	Monthly
13. Source Telecomputing Corp. McLean, Va.	The Source	On-line access to a variety of business and consumer-oriented data bases and computer services	Varies with each data base or service offered
14. The Bureau of National Affairs, Inc. (BNA) Washington, D.C.	Laborlaw	On-line access to information on federal and state judicial and administrative decisions on labor and employment	Monthly
15. Official Airline Guides, Inc. Oak Brook, Ill.	OAG Electronic Edition	On-line access to North American and international airline schedules	Monthly
16. Management Contents Northbrook, Ill.	Management Contents	Citations and abstracts on business and management available on-line or in print	Monthly
17. Newsnet, Inc. Bryn Mawr, Pa.	Newsnet	On-line access to full text of 120 business-oriented newsletters on specialized subjects	Varies with each newsletter
18. Institute for Scientific Information Philadelphia, Pa.	Scisearch	On-line access to citations from scientific and technical literature	Monthly
19. Information Access Co. Menlo Park, Calif.	Magazine Index	Citations to popular U.S. and Canadian magazines available on-line or in microfilm	Monthly
20. Congressional Information Service, Inc.	American Statistics Index (ASI)	Citations and abstracts to U.S. government statistical documents available on-line and in print	Monthly
21. Economic Information Systems, Inc. New York, N.Y.	X/Market	On-line access to information on sales and purchases of U.S. businesses	Three times yearly
22. Dow Jones & Co., Inc. Princeton, N.J.	Dow Jones News	On-line access to full text of the *Wall Street Journal* and other business news publications	Continously (direct); weekly (BRS)
23. Disclosure, Inc. Bethesda, Md.	Disclosure II	On-line access to financial information on publicly held U.S. corporations	Weekly
24. Business International Corp. New York, N.Y.	BI/Data	On-line access to annual time series data on international economics and finance	Daily (General Electric Information Services Co.); quarterly (other distributors)

1. Many of these companies have companion or parallel products available in print or in microform. The reader should contact the producing company for more detailed information about available delivery formats.
2. The reader should contact the producing company for exact, current information on content, prices and sources of availability.

IN DEPTH

Existing Information Resource Investments

	1970		1980	
	Internal	External	Internal	External
Data	99%	less than 1%	95%	less than 1%
Text	less than 1%	insignificant	2%-3%	insignificant

Predicted Growth in Information Resource Investments

	1985		1990	
	Internal	External	Internal	External
Data	85%-90%	3%-5%	60%	5%-10%
Text	6%	3%-5%	10%-15%	15%-20%

Managers' Predictions on Data Sources

(Continued from In Depth/3)

Traditionally, MIS departments have been primarily concerned with creating internal data bases and information systems to support the large number-crunching applications such as inventory control, personnel, payroll and financial accounting. Most of the facts and figures in these data bases and systems come from inside the company (records, files, reports and so forth).

In the few instances when external data was needed to combine with internal data, the data elements were brought in by tapping print journals or financial and business reports or government statistical reports. Rarely did organizations tap such data directly in on-line, machine-readable formats from commercial data bases.

Of course, in the '60s and '70s relatively few external, machine-sensible information resources existed. Now, however, according to one estimate, the number of commercially available on-line data bases is approaching 5,000. Most are not even listed in catalogs yet, and the line between electronic mailboxes and on-line data bases is very thin.

Until recently, data base management software was not yet sophisticated enough to deal with the more complex problems of text information storage, handling and retrieval. Now, however, DBMS packages can easily handle both data and text files, even in integrated document contexts or document image contexts.

'Until recently, data base management software was not sophisticated enough to deal with the more complex problems of text information storage, handling and retrieval. Now, however, DBMS packages can easily handle both data and text files, even in integrated document contexts or document image contexts.'

But instead of bringing in such external data, replicating it and making it "resident" in internal files, MIS directors may find it more cost-efficient to let the providers and vendors keep the data base current and simply download the data once accessed from the providers and vendors.

Several years ago, I surveyed MIS directors in 120 companies to find out how they saw the evolution of external text data base access and use. The consensus of this sample of DP executives was that external information resources clearly would be a growth area (see box).

Many observers of the information marketplace believe that a large segment of the "software explosion" will come to depend on a symbiosis

(Continued on In Depth/10)

ALL YOU NEED TO CUT CICS DEVELOPMENT TIME IS A JUNIOR COBOL PROGRAMMER AND SCISSORS.

Cut yourself in on ACCOLADE and increase your productivity 800%.

ACCOLADE is a new concept in application development software for your CICS system. Sign up now for a free demonstration. We'll show you and your Jr. COBOL programmer how to develop CICS COBOL applications on-line quickly and easily with no sacrifice in CPU efficiency. Fill out and mail to: David Alschuler, Vice President, Multiplications, Inc., 1050 Massachusetts Ave., Cambridge, MA 02138. Or call any of our offices below.

Name

Title

Company

Address Phone

City State Zip

Atlanta (404) 256-5949, **Boston** (617) 864-5810, **Chicago** (312) 655-8981, **Los Angeles** (714) 964-0853, **New York** (201) 382-4300, **San Francisco** (415) 430-8107.

MULTIPLICATIONS *

ACCOLADE is a trademark of Multiplications Inc.

"If you want to do OEM computer business in the U.S., you'd better go to the Invitational Computer Conferences in Boston, Dallas, Minneapolis, Orange County, Washington, D.C., Los Angeles, Ft. Lauderdale, ...We do!"

JOHN GILLIGAN, President
Dataram Corporation

Experienced marketing management knows that the best way to reach the technical decision maker/buyer is to meet him where he lives and works, demonstrate operating equipment and provide him with the technical information he needs. Over the past 12 years successful marketers have found the Invitational Computer Conferences to be the most cost-efficient, effective method of covering their U.S. computer industry customer base.

The exclusive, one-day, OEM conferences will be held in ten major market areas throughout the United States and are attended by a select, invited audience of OEM's, systems houses and quantity end users. Guests can attend a variety of technical seminars and view operating displays of the newest computer and peripheral equipment. The informal setting makes it easy to meet with potential customers one-on-one and the simple tabletop displays keep exhibit costs at a minimum.

For more information:
B.J. Johnson
& Associates, Inc.
3151 Airway Ave. #C-2
Costa Mesa, CA 92626
(714) 957-0171

1983-84 SERIES

Sept. 13, '83	Newton, MA
Sept. 29, '83	Minneapolis, MN
Oct. 18, '83	Valley Forge/ Philadelphia, PA
Oct. 20, '83	Washington, D.C./ Vienna, VA
Nov. 8, '83	Houston, TX
Nov. 10, '83	Dallas, TX
Jan. 9, '84	Irvine, CA
Feb. 7, '84	Ft. Lauderdale, FL
Feb. 28, '84	Los Angeles, CA
Mar. 1, '84	Palo Alto, CA

IN DEPTH

— *A Forum for Information Policies, Opportunities* —

The Information Industry Association (IIA), headquartered in Washington, D.C., sees itself as a "business-oriented response to the so-called 'information revolution' in the United States." This association:

1. Serves a $10 billion-plus industry with an annual growth rate of 20% to 30%.

2. Provides a continuing forum for all information-content, communications and computer companies.

3. Helps those companies participate in, take advantage of and profit from the development and operation of the vertical communications structure that is emerging nationwide.

4. Convenes meetings, issues publications, contracts for surveys, prepares testimony, negotiates with federal agencies and provides other arenas for member companies to interact with other participants in the information marketplace.

5. Produces an annual membership directory and publishes a weekly newsletter for insiders.

6. Functions through three councils: Business Operations, Public Policy & Government Relations and Future Technology & Innovation.

The IIA will hold a conference Nov. 7-9 at the World Trade Center in New York City. There, the association expects to release the findings of the second financial survey of the industry — *The Business of Information Report 1983*. Researched by the A.C. Nielsen Co., the report will profile the industry's subsectors, describe the current and projected marketplace, give some indication of collaborators and competitors and identify the key executives and professionals in the business.

The following kinds of product and service lines will be described:

- Library and information networks.
- Software products.
- Abstracting and indexing services.
- Computerized searching.
- Consulting and planning services.
- Data base producers and publishers.
- Data collection and analysis services.
- Information on demand.
- Library management systems.
- Micrographic applications and services.
- On-line vendors/telecommunications networks.
- Videotex/teletext.
- Cable TV.
- Community information and referral systems.
- Document delivery systems.

The IIA has also published a four-volume handbook, *Understanding U.S. Information Policy*. The core of this handbook is a list of nearly 150 "policy building blocks" — concerns and issues of broad interest and consequence such as AT&T restructuring, the Sony Betamax case, government's role in the information marketplace and copyright issues.

IIA headquarters are at Suite 400, 316 Pennsylvania Ave. S.E., Washington, D.C. 20003.

DEC OEM's

Interested in software package for one of the fastest growing vertical markets. Complete support. Territories avail. throuout New England. Direct inquiries to Beverly Brown, 617-890-7730, THE BUSINESS SERVICES GROUP INC., a subsidiary of Data Architects Inc., 245 Winter St., Waltham.

(Continued from In Depth/8)
between applications software and the products and services of information companies.

Mechanics of Distribution

Delivery modes vary across the spectrum — data communications services and networks, electronic mail/messaging systems, facsimile, local-area networks, electronic publishing, print and microform publishing, satellite services, teleconferencing, telegram. telex, videotex/teletext, two-way interactive cable television and voice communications services.

Almost all of the on-line vendors and telecommunications networks charge a base subscriber fee, a one-time connect charge and then a use fee on top of those charges based on the actual time subscriber users are plugged into their networks and computers.

These fee structures can become somewhat complex, depending on whether subscribers are profit-making or not (for example, educational institutions), the kind of data base accessed (publicly available or privately created) and the specific search algorithm selected.

Some algorithms are very powerful, and vendors tend to charge more for them.

While "information-content" companies must be sensitive to the needs of their subscribers and clients to ensure they pick the right delivery systems (or right mix of systems), still their distinctive niche in the electronic marketplace comes from the contribution of their information professionals — scientists, editors, abstractors, indexers and product designers as well as marketers. Sometimes the packaging and marketing of the product in a particularly innovative or creative way is the biggest challenge.

Integrating Resources

For the MIS executive, the challenge is to find a way to integrate both the internal and external information resources into a single, synchronized total enterprise information resource environment.

One approach to marrying internal and external data bases and resources is a "knowledge gateway system" using a meta-knowledge base.

Missing at the moment is a focus on the internal-external interface. The linkage problems are too complex to be solved by just throwing a data base management system into the breach.

Companies must develop a matrix of internal and external information flows and holdings first at the generic-information-class level and second at the data-element level to see where internal and external flows and holdings are identical, similar or quite different.

They must then analyze the two streams side by side to identify overlaps or gaps, where neither internal nor external information resources are meeting needs of company personnel. Only after organizations complete this information management analysis should they attempt to move toward developing the meta-knowledge data base itself, which, by definition, will meld internal and external flows and holdings. If an MIS director thinks this is a simple software programming problem, he has been in solitary confinement too long.

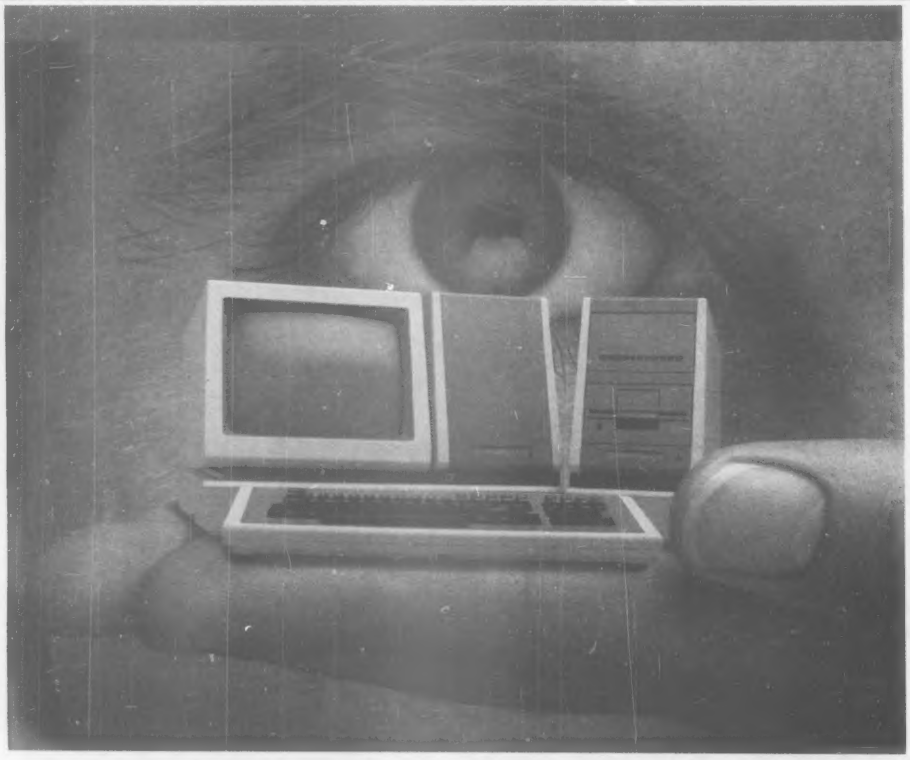
About the Author

Forest Woody Horton Jr. is a Washington, D.C.-based consultant specializing in information management.

From 1975 to 1978, Horton directed the Information Management Study for the Commission on Federal Paperwork, which was responsible for promulgating the concept of information resource management.

Prior to that, Horton directed MIS and DP staffs for the Executive Office of the President, the State Department, elements of the Department of Defense, the Environmental Protection Agency and the General Services Administration.

Horton is author or editor of five books in the information management field and has been a contributing editor to a half-dozen information-related publications. He has also held teaching tenures at several universities, including the University of Maryland, Syracuse University and American University.



CIES 680 Business Computer

THE NEW GIANT IN MICROS

If we're calling ourselves "the new giant in micros," we had better be able to back it up. Which we can. And we should also have the wherewithal to back you up. Which we do.

CIE Systems makes the CIES 680 series of micro business computers.

At the heart of a 680 is the combination of the 32/16-bit 8MHz 68000 microprocessor and Intel's Multibus™ architecture for maximum configuration flexibility.

The 680 hardware is totally modular. And because we can supply OEMs with everything from boards on up, you can easily configure your system for virtually any market.

CIES provides the software to match its 680 architecture.

The operating systems offered include UNIX,™ REGULUS™ (UNIX subset) and RM/COS.™

Prewritten applications cover a wide variety of business operations, ranging from general accounting modules to financial modeling and word processing systems.

Language processors include BASIC, FORTRAN, COBOL and PASCAL.

Even more, CIES offers PRO-IV,™ the latest in software technology. PRO-IV is an applications processor that allows you to easily and quickly develop customized applications without programming or code generation.

No computer maker has ever had greater financial or manufacturing support than CIE Systems.

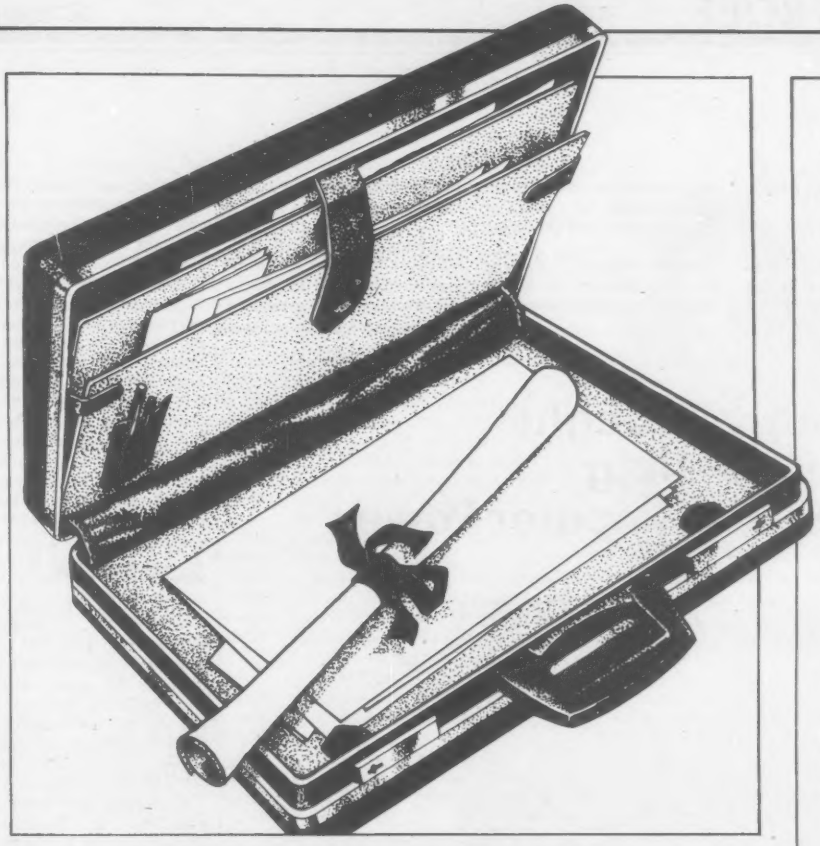
We're backed by the gigantic resources of a 125-year-old, worldwide corporation with well over $50 billion in sales.

Our future is assured. Your future can be assured with the CIES 680 Business Computer Systems and our giant commitment to continuing state-of-the-art technology and quality in any quantity.

For more information, just call or write CIE Systems, Inc., 2515 McCabe Way, Irvine, CA 92713-6579 (714) 660-1800. Call toll free, 1-800-437-2341. In California call 1-800-458-6279.

CIE SYSTEMS
A CITOH ELECTRONICS COMPANY

TM Multibus is a Trademark of Intel Corporation.
REGULUS is a Trademark of Alcyon Corporation.
PRO-IV is a Trademark of Data Technical Analysts, Inc.
UNIX is a Trademark of Bell Laboratories.
RM/COS is a Trademark of Ryan-McFarland Corporation.



University's Role Is Education, Not Programming

A recent letter to *Computerworld* [Jan. 17] by A.W. Holtsberry of Westerville, Ohio, stated, "During the past year I have discussed the shortage of skilled programmers and programmer analysts with at least 50 different senior DP executives. At least 50% of the executives with whom I spoke stated that they never hire new graduates."

Does this imply that the nation's universities are not providing proper instruction of their students for entry-level positions in industry?

There is no doubt that industry today suffers from a lack of qualified programmers. There now is approximately a four-year backlog in the generation of application software.

But it is not the role of the universities simply to turn out programmers. In particular, computer science departments in universities must produce graduates who are educated in many aspects of computer science, who understand systems architecture, data base and so forth and who are flexible and can adapt their skills to the current and future needs of industry, business and government.

The computer field is changing at an amazing pace, creating totally new developments every five years. The universities would be remiss if they turned out graduates whose narrow skills had only a five-year tenure. And industry would be remiss if it expected the universities to do so.

You used the phrase "proper instruction of their students." A

Leonard Kleinrock, Educator, Engineer

What function should universities serve in the education of computer science undergraduates? Science writer Irving Bengelsdorf interviewed Dr. Leonard Kleinrock, UCLA professor and president of Technology Transfer Institute, for his perspective, which spans academia and industry.

On May 5, 1982, Kleinrock and Dr. Lawrence G. Roberts shared the Lars Magnus Ericsson Prize in recognition of their contributions to packet switching. In ceremonies at the Stockholm Museum of Technology, His Majesty King Carl Gustaf XVI of Sweden presented the two with diplomas, gold medals and an award of $35,000.

The Ericsson Prize, established in 1976 to mark the centennial of the founding of the L.M. Ericsson Telephone Co., is awarded every third year to those individuals "who make especially important scientific and technological contributions in telecommunications engineering."

Kleinrock, professor of computer science at the University of California at Los Angeles, holds a bachelor of science degree in electrical engineering from City College of New York (1957) and a master's and doctorate in electrical engineering (1959 and 1963) from MIT. He is a member of the National Academy of Engineering, is both a Guggenheim and IEEE Fellow and serves on IBM's Science Advisory Committee.

(Continued on In Depth/12)

Dr. Leonard Kleinrock

IN DEPTH

university's role is education, not training.

For a university to focus its teaching on the development of programming skills would be the same as focusing an engineer's education on the development of drafting skills.

Such training is properly done in two-year community colleges, in qualified trade schools and at on-the-job training in industry. We at the university must teach fundamentals as well as state-of-the-art technology.

But since there is a shortage of programmers, it seems these community colleges or trade schools are not training them.

Apparently not. I feel, however, that the programmer shortage will be solved shortly. It has been estimated that if we continue to absorb programmers at our present rate, then there would be a need for 27 million programmers by 1990!

Clearly, even if the universities did turn out armies of programmers, this number would be impossible to attain. There would be nobody left to do any useful work. It reminds me of the prediction in the 1920s that the number of telephone operators the telephone company would eventually need would turn out to be larger than the total number of

Kleinrock

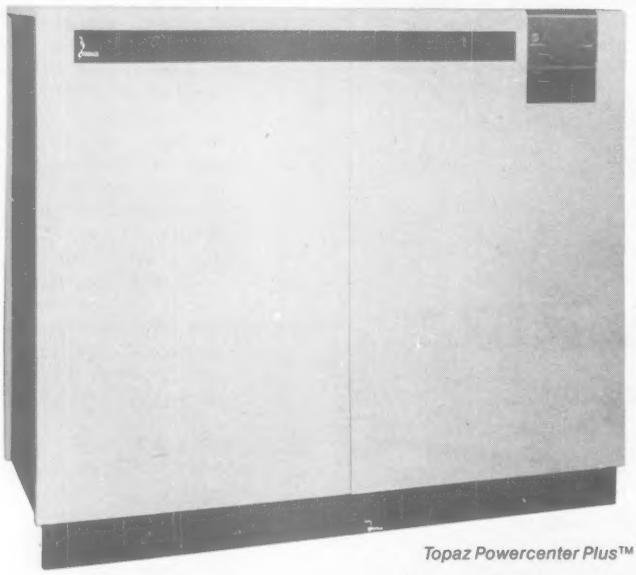
(Continued from In Depth/11)

Kleinrock's research, which emphasizes the modeling, analysis and measurement of computer networks and queueing systems, has led to the publication of more than 120 professional papers and three books dealing with these subjects.

Kleinrock also serves as president of Technology Transfer Institute, the Santa Monica, Calif.-based company that provides consultation services and sponsors seminars in the fields of networks, communications, data processing systems and management.

Technology Transfer Institute's fall 1983 seminar schedule includes a three-day seminar by Kleinrock titled "Computer Networks," a five-day seminar with James Martin speaking on "The DP Crisis and its Solutions" and a three-day seminar with Jerome Svigals and Donald Long discussing "Emerging to Electronic Banking." In addition, a one-time, four-day seminar featuring Edward A. Feigenbaum will deal with "Knowledge Base and the Fifth Generation."

You Probably Thought
We Were Selling
Computer-Controlled Computer Power.



Topaz Powercenter Plus™

Actually...We're Selling Peace of Mind.

Some jobs are difficult. Others are just plain impossible – like estimating all the costs of computer errors due to line voltage sags and surges, to say nothing of brownouts. But now for a small percentage of your facility investment, you can have complete protection against troublesome voltage variations. And you can have immunity from noise and the effects of load changes, frequency changes and power-factor changes too. Not to mention flexible distribution of power throughout the computer room, monitoring of all key power parameters, and two-level facility protection. Powercenter Plus– it's the only power distribution center that does it all. Complete with microcomputer-controlled power conditioning, of course.

That's peace of mind.
That's our business.

TOPAZ

9192 Topaz Way, San Diego, California 92123-1165—(619) 279-0831 — TWX: (910) 335-1526

FusiCalc™
On IBM/36?

Call for details about FUSION 3, 'Electronic Worksheet' and Financial Modelling System.

FUSION
PRODUCTS INTERNATIONAL

(415) 381-1340
PO Box Fusion
Mill Valley, CA 94942
Telex 176099 FUSION

'A future army of programmers is not needed. The programmers will largely be dealing with more sophisticated tasks.'

women then alive in the United States.

So, clearly the estimation of the need for 27 million programmers by 1990 is way off the mark. The U.S. now is strangled in a jungle of software development and maintenance. But there really is no need for so many programmers.

In my opinion, the day of the "Cobol-type" programmer is limited. Currently, the fourth-generation languages like Mantis, Focus and Ramis provide application generators that allow the users to bypass the DP department for their application software.

The recent work of Margaret Hamilton and Saydean Zeldin now allows us to create bug-free software that automatically generates logically correct programs. Although these systems are dependent upon a profoundly mathematical base, the mathematics is hidden under a user-friendly set of tools.

These new software systems are powerful and practical because they can be used by individuals with no knowledge of either mathematics or programming to design provably correct systems. These will allow a user — with or without a programmer's help — to specify what he wants to have done.

So, the present problem involving a deep backlog of user applications will likely be solved by the introduction of the aforementioned user-oriented nonprocedural languages. The work will be offloaded to the less sophisticated user, who also will get immediate feedback regarding his efforts.

A future army of programmers is not needed. The programmers will largely be dealing with more sophisticated tasks.

King Carl Gustaf XVI of Sweden presents the Ericsson Prize to Leonard Kleinrock and Lawrence Roberts for their work in packet switching. Roberts is president of GTE Subscriber Network Products.

Companies will have difficulty surviving if top management is slow to recognize and make the revolutionary changes. Information now is available at the touch of a terminal, and management must see to it that all personalized data bases are consistent, intercommunicative and able to be modified readily. Otherwise, DP will become a modern Tower of Babel.

Obviously, what is preventing these changes from taking place is the large investment in existing software and file systems and the enormous cost needed to convert it. But I think it is better to bite the bullet now. The longer a company waits to

"WE HAVEN'T LOCATED THE PROBLEM YET."

Overlooking the human dimension?

Isn't it true that every information executive basically has access to the same hardware and the same software?

What is it then, that causes one information shop to hum along productively, while another limps along, dragging a reputation as a burdensome cost center.

The essential difference usually can be found in the "human dimension," an aspect of senior-level information management that too often is overlooked.

Face it, people are your biggest investment, the source of most of your problems, and your asset with the greatest competitive potential.

For your career, and the careers of those who work for you, enter the "human dimension" with us in September. You'll emerge as a more informed human resources manager and a more effective leader.

15th Annual Conference
Society for Information Management
September 11-15, 1983 San Diego

For registration information, call Louise Fields at (312) 644-8610

Westwood is a Texas Instruments Supermarket

WESTWOOD, the East Coast's computer professionals since 1964, is a leading authorized dealer for Texas Instruments. We stock T.I.'s Silent 700 and Omni 800 Electronic Data Terminals and the T.I. Professional Computer. Call us today for your data terminal and microcomputer needs. We offer immediate delivery, unsurpassed reliability, customer support and a highly experienced service department.

THIS MONTH'S SPECIAL
WHILE THEY LAST
Refurbished TI
MODEL 810RO $995
w/package options List Price $1905

Westwood
DATA COMMUNICATIONS EQUIPMENT
25 Route 22 E, P.O. Box 518, Springfield, N.J. 07081

Corporate HQ, NJ (201) 376-4242 • **NYC** (212) 662-0060 • **Conn.** (203) 932-6383 • **Phila.** (215) 972-0283 • **Pittsburgh** (412) 881-2590 • **Boston** (617) 451-6550 • **Baltimore** (301) 358-7820 • **Cleveland** (216) 476-9336 • **Wash., D.C.** (202) 737-0244 **Camden** (609) 829-7280

We Deliver!
SALES – LEASES – SERVICE

IN DEPTH

convert to the newer techniques, the more it eventually will have to pay.

But is there a place for programming in university instruction?

Indeed there is, but in a complementary rather than an exclusive role. University students should gain general programming skills as needed in their science and engineering classes and in any pertinent arts and humanities courses, as well as in their projects and research. But industry cannot expect university graduates to be trained in any particular industry's specific programming needs. This is a training role for industry itself.

In the same sense, a university should not necessarily teach a control engineer the detailed control theory for the pharmaceutical industry, for example, but should give him a good background in general control systems. It is worth repeating that the university makes available to the work force bright young graduates with generalized skills who are flexible enough to adapt to the specific and changing needs of a particular employer.

If the role of the universities is not to teach programming, then what should universities teach about the field of computers?

This is an ongoing controversial question because computer science is such a young, rapidly changing yet all-encompassing field. Its principles are not as fully developed as, say, electrical engineering, which is a well-understood, older discipline with a well-developed body of knowledge, common principles and excellent textbooks.

The curriculum in computer science at University A may be quite different from that at University B. One school may emphasize computer languages, another hardware and still another artificial intelligence. Not only are the university offerings in computer science varied, but they also keep changing with time. Despite various attempts, there is less than universal agreement among academicians as to *the* curriculum in computer science.

Nevertheless, in my opinion, students in universities should certainly be familiar

3270 Users...
Get 3278 Features for less than 3178 Prices.
...from PHAZE

A superior value

IBM announced its 3178 on March 8, 1983. The PHAZE P3278 has been available since November 8, 1982. Our lower cost, more functional 3278/3178 alternative is available now. And, at $1545, our coax plug-compatible P3278 will be the star of your add-on and replacement program. That's because PHAZE makes the addition easy. More importantly, you'll get a host of special features not found on theirs. That makes PHAZE a good buy, and a superior value.

Easy to use

The compact, modular P3278 can be installed in less than 60 seconds. Without heavy lifting. Without tools. Easy installation reflects the human engineering features of the unit. Features like an easy-on-the eyes, non-glare screen that tilts and swivels with fingertip command. A thin movable keyboard, with a continuously adjustable angle through the optimum range. And PHAZE meets the tough European human factors requirements.

Extras that don't cost extra

Standard features include an 87-key typewriter keyboard with 24 program function keys, a 12-key numeric keypad, automatic video shutdown, combination security locks, a numeric lock and an audible alarm. The only option to buy is a light pen.

Satisfaction guaranteed

PHAZE makes your purchasing decision risk-free. In addition to our standard 90-day warranty, we offer a 30-day money back guarantee if you're not completely satisfied with our product.

Terrific price. An unusual range of features. Money-back guarantee. And liberal quantity discounts. PHAZE will make you a purchasing legend in your own time. Call us today to place your order or to obtain more information. Ask for H. P. Watson at **(602) 991-6855.**

PHAZE INFORMATION MACHINES CORPORATION

We make the addition easy

PHAZE Information Machines Corporation
7650 East Redfield Road
Scottsdale, Arizona 85260

PHAZE is a registered trademark of PHAZE Information Machines Corporation.

NEW LIFE FOR 1401 PROGRAMS

CS-TRAN converts your 1401 *object* programs to COBOL for the mainframe or mini of your choice.

CS-TRAN is the *only* translator that accepts your object programs, patches and all, yet allows you to include actual COBOL paragraph names and record definitions.

If you'd like more details about new life for your 1401 programs just call or write Russ Sandberg.

C·S Computer Systems Inc.
200 South Main Street, P.O. Box 356
Manville, NJ 08835 • 201-526-9000

with such subjects as data structures, data base management, programming languages, operating systems, computer communications, discrete mathematics, architecture, knowledge base and expert systems.

The field of computer science is so new that even its professors at universities are continually on a learning curve.

We publish a *UCLA Computer Science Quarterly* in which letters from alumni working in the field provide excellent feedback from their employment experiences. They tell us what they think the UCLA computer science and engineering curricula should contain.

We pay attention to and learn a good deal from these letters.

So you feel industry, government and business should be hiring university computer science graduates for their entry-level positions?

Absolutely. Not only do university graduates represent huge potential future assets, but the luxury of being able to hire experienced DP professionals soon will disappear. The latter are in very short supply.

Along with industry's difficulty in recruiting personnel, there also is the associated difficulty in retaining them. Because the computer industry is in a great state of flux, there is a great deal of mobility in the job market as people continually are hired away by new start-up companies.

Industry should ask itself: What keeps a person loyal to his job? I feel an exciting product or a challenging environment plays a more important role in retaining personnel than does salary.

Do you think the complaints from the computer industry about the alleged maleducation of university graduates are specific to that industry, or are such complaints also voiced by other industries?

This is an old story. Engineering companies have complained for years that university graduates are poorly trained for their specific industrial needs. The same is true for many manufacturing companies. The only difference with the computer industry is that it operates at a much greater rate of change than has been experienced by any other industry before it.

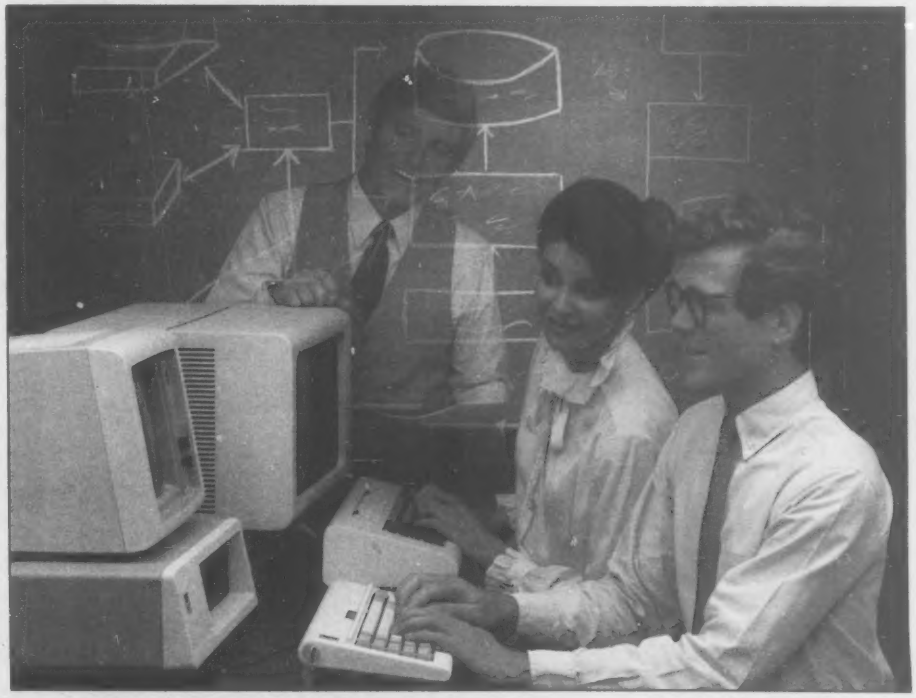
Whatever difficulties do crop up, therefore, become exacerbated.

I feel that part of the complaints are based upon the eternal dichotomy between the academic and industrial worlds. Students in universities have their professors as role models, and they are concerned with the treatment of such technical issues as may be addressed in their professional journals.

Industry, however, deals with the totally different issues — cost, product life cycle, software life cycle, maintenance, availability, manufacturing, flexibility, safety and so on — that are described in trade journals.

Students should certainly be aware of such issues, but they need not be part of their

SCHOLAR/TEACH 3® makes every terminal a virtual teacher.



We know.

At Boeing Computer Services, we know the importance of good teachers. But even good teachers can only be in one place at a time.

After years of experience with both classroom training and computerized learning, we have developed a unique software product that lets you deliver your best teaching. On request. Repeatedly. No student travel required. It's called SCHOLAR/TEACH 3, and it can train 3,500 students a week.

Our training background with many different kinds of employees helped us create flexible authoring and presentation software to support any number of subjects. From making reservations to handling insurance claims to creating COBOL programs.

Furthermore, SCHOLAR/TEACH 3 is designed to fit your equipment. You can author or present your training sessions on your IBM or compatible mainframe. Or IBM PCs. Or use our MAINSTREAM® teleprocessing network.

And, because SCHOLAR/TEACH 3 was designed by experts in both training and computing, we can meet your special training needs.

We've trained more than 500,000 employees both within The Boeing Company and other major corporations throughout the world. Now we'd like to share what we know with you.

Send for your FREE copy of *Ten Things You Should Know About CBI.*

Just write Boeing Computer Services, Education & Training Division, P.O. Box 24346, M.S. 9A-90-8B, Seattle, WA 98124. Or call us today toll-free at **800-342-7700**. Discover the lesson we've learned: behind all good CBI is the spirit of a good instructor.

BOEING COMPUTER SERVICES A Division of The Boeing Company

®SCHOLAR/TEACH 3 and ®MAINSTREAM are registered service-marks of The Boeing Company.

SAS... Power and Flex to Meet All You

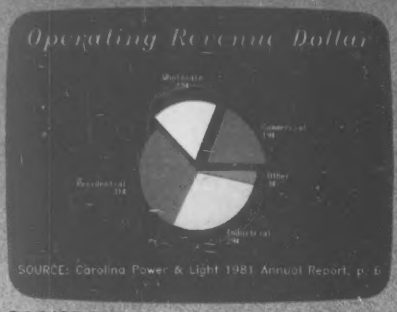
If you're looking for one software system to meet all your needs, join the over 6000 businesses, government agencies and educational sites where SAS products are used everyday.

SAS/GRAPH

SAS products provide an integrated system for:

- data management, statistical analysis and report writing—SAS®
- color graphics—SAS/GRAPH™
- econometric forecasting, modeling and row-and-column financial reporting—SAS/ETS™
- full screen data entry, editing, letter writing and spreadsheet financial reporting—SAS/FSP™
- interface to IMS/VS or CICS DL/I data bases—SAS/IMS-DL/I™
- operations research tools for business planning and scheduling—SAS/OR™

SAS/OR



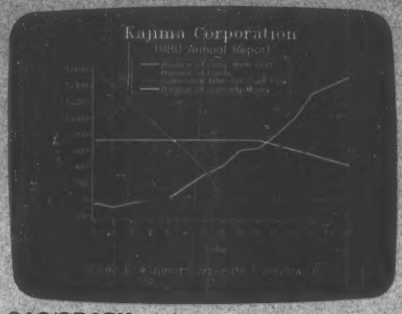
SAS/GRAPH

With the SAS System you get the power to handle all your needs quickly and efficiently. Plus you get a flexible system that can grow as your needs grow and change.

SAS/GRAPH

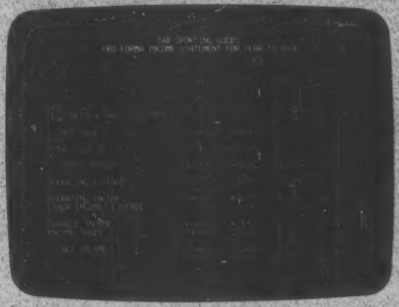
You get a twofold advantage with the SAS System. A library of ready-to-use procedures gives you the power to analyze data without formal training. SAS even provides an on-line help facility. Or you can create your own help program. With a few English-like commands, you can use SAS for data analysis, market research, capacity planning, financial reports, summary statistics, charts, plots, personnel reports and many other jobs.

In addition to these routine tasks, the SAS System handles your complicated programming needs. Extensive data management and retrieval tools, combined with a sophisticated macro facility, allow your decision support staff to create and store complex SAS jobs. You can invoke these programs with one command, giving you easy access to the data today that will help you make important business decisions for tomorrow.



SAS/GRAPH

In short, the SAS System gives you the analytical tools for a complete Decision Support System—integrating modeling, statistical manipulation, graphics and multiple data sources.



SAS/ETS

SAS is the registered trademark of SAS Institute Inc., Cary, NC, USA. SAS/GRAPH, SAS/ETS, SAS/FSP, SAS/IMS-DL/I and SAS/OR are trademarks of SAS Institute Inc.
VAX is a trademark of Digital Equipment Corp., Maynard, MA, USA. Copyright © 1982 by SAS Institute Inc.

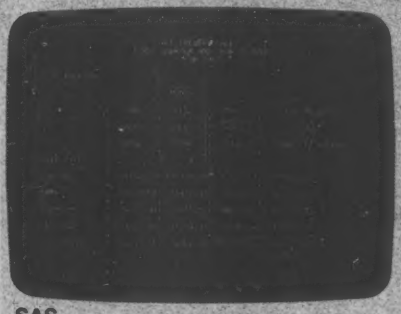
Available for IBM, DG ECLIPSE and DEC VAX

ibility
r Needs

SAS/GRAPH

SAS/FSP

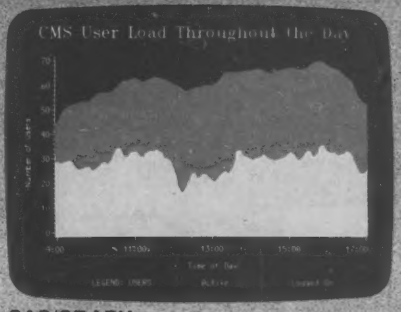
When you lease the SAS System, you don't get a static product. You get a system that grows and changes as your needs grow and change. Originally supported only on IBM 370/30xx/43xx under OS and TSO, SAS products currently run under OS, DOS/VSE and SSX in batch, and interactively under TSO, VM/CMS and ICCF.



SAS

What's more, the SAS System now runs on Digital Equipment Corporation's VAX™ 11/7xx series.

You get the same benefits of the SAS System on minis as on mainframes. To see for yourself, take advantage of our free trial.



SAS/GRAPH

But that's not all. Our continuing development efforts are backed by a complete library of user documentation, a comprehensive training curriculum, a full-time technical support staff and an international users group.

In fact, users have ranked SAS in Datapro Research Corp.'s Top Rated Group for the past seven years. In the latest survey, SAS was one of the only two software packages to receive the honor.

The best in software and service. At a price you can afford.

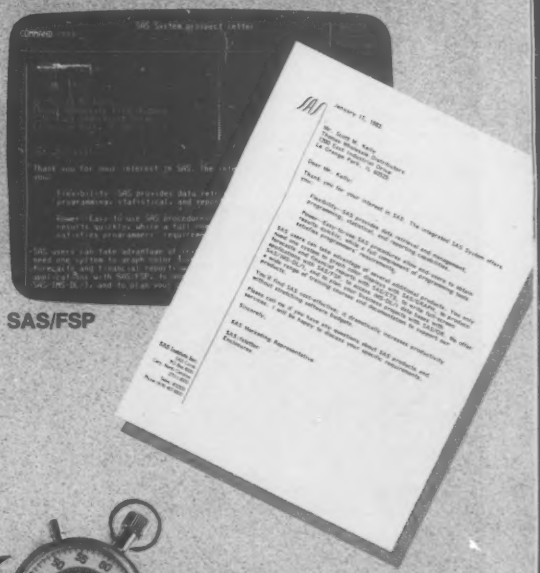
Call today for SAS—power and flexibility to meet all your needs. SAS Institute Inc., SAS Circle, Box 8000, Cary, NC 27511 USA. Telephone (919) 467-8000. Telex 802505.

SAS Institute GmbH, Rohrbacher Strasse 22, D-6900 Heidelberg 1, West Germany. Telephone 06221-29014. Telex 461581.

SAS Software Limited, The Centre, 68 High Street, Weybridge, Surrey KT13 8BL, UK. Telephone 0932-55855. Telex 946138.

SAS Institute (NZ) Ltd., Level 9, Greenock House, 39 The Terrace, PO Box 10-109, Wellington, New Zealand. Telephone (04) 727-595. Telex NZ 31525.

SAS Software Pty. Ltd., Level 60, MLC Center, 19-29 Martin Place, GPO Box 4345, Sydney, NSW 2001, Australia. Telephone (02) 235-2199. Telex AA 71499.



SAS/FSP

SAS® saves time.

IN DEPTH

formal education.

I tell my students that in addition to reading their professional journals, they should also look at these trade journals, at least, to become aware of what is going on in the "real world."

I suspect that this academic-industrial dichotomy in the world of computers will never be bridged completely, because the same dichotomies still exist in the older engineering disciplines.

'Our social dynamic is competitive rather than cooperative. I feel this will have to change. What we now need is a greater sense of cooperative national goals. The computer industry must cooperate much more both with government and universities.'

We have talked about what the computer industry wants of universities. What do you, as an academician, want industry to do?

This is a crucial question because the computer field is not developing solely as an American industrial enterprise, as did many other industries in the past.

We now have to contend with an extremely potent foreign competitor, Japan Incorporated. The Japanese have been extremely successful in dominating the consumer electronics industry and, in the near future, probably will dominate the computer industry as well. They probably will beat us out in the 256K memory chip and, very possibly, in microprocessor chips.

To paraphrase Dr. Lewis Branscomb, chief scientist at IBM, the Japanese have as their goal to achieve not only parity, but superiority in computer technology, regardless of how much money and time it takes. That is a frightening situation to contemplate.

The Japanese social dynamic permits a hand-in-glove cooperative effort to be mounted by industry, government and universities.

This kind of effort is what is going on as Japan starts toward the fifth-generation computer. But our social dynamic is competitive rather than cooperative.

I feel this will have to change. What we now need is a greater sense of cooperative national goals. The computer industry must cooperate much more both with government and universities.

Whatever efforts are undertaken, they must be large in scope with respect to personnel, money, equipment and joint projects.

Some of these now are being realized: the establishment of Microelectronics and Computer Technology Corp. (MCC) to work toward fifth-generation computers, the supercomputer effort recently announced by the Department of Defense, the multimillion-dollar and multiyear computer science research contracts from the National Science Foundation and the large equipment grants to universities from IBM.

So, awareness of the powerful external Japanese threat is here, but many more intersocial and intereconomic barriers will have to be reevaluated in an attempt to meet this threat.

What role, if any, should universities play in the face of the Japanese threat?

The universities are presently involved in many ways, both directly and indirectly.

Through support by the Department of Defense Advanced Research Projects Agency (Darpa), many universities will be participating in the supercomputer project.

This is a multiyear project of large magnitude.

In a more indirect manner, university participation can be witnessed in joint efforts on the industrial or corporate fronts, such as in

DEFENDER II.

The Next Generation Dial-Up Computer Access System.

Preventing unauthorized telephone access to your computer while managing the growth of dial-in capability in your organization has never been easy. Until now!

Introducing Defender II. The next generation.

Defender II provides a unified approach to the intelligent management of dial-up modems at your computer site. Any number of Defender IIs can be configured with up to 48 modems each, and all may have their access controlled through dial-up/call-back procedures. That means security. For yourself. And, more importantly, for the information in your computer.

Each Defender II modem is monitored on a continual basis. All transactions are reported (to a printer, terminal and/or computer), including telephone call origination and termination times, duration of call, supervisor access and more. This, combined with our Least Cost Routing technique, brings computer phone-line costs back under your control.

Moreover, by utilizing Digital Pathways proprietary, bus-controlled 212A modems, Defender II offers something totally unique: the ability to automatically send messages to a predefined list of phone numbers – especially useful for distributing computer status information, product announcements to sales forces or any other mass-distribution message. This computer-independent messaging provides an invaluable tool in computer-down situations.

If you'd like to know more about how Defender II can help solve your dial-up computer access problems, call or write today for more information.

DIGITAL PATHWAYS

1060 East Meadow Circle
Palo Alto, CA 94303
TEL: (415) 493-5544
TWX: 910-379-5034

United States Headquarters:
(415) 493-5544
Western Regional Office:
(714) 476-2162
Canada: (403) 286-2744

the recently established MCC Consortium in Austin, Texas. One need only notice the affiliations of many members of the group to be convinced that universities are indeed playing a role.

Probably, though, the most important arena in which universities can help avert Japanese dominance is in the field of artificial intelligence and expert systems. It is to these areas that great attention must be paid if we are to head off this so-called threat. AI has come of age in research institutions here in the U.S., and our universities play vital roles in maintaining and extending the lead we hold in the development of expert systems.

Do you think the pace of change in the computing field will slow down soon?

Absolutely not. The problem associated with rapidity of change will get worse, not better. As the reliability and performance of microchips increase, and as the cost decreases, the two major technologies of computers and communications will continue to converge. Local, national and international information networks are here.

Both IBM and AT&T suddenly find themselves competing in the same marketplace. Both deal in the handling of information.

We joke about the likelihood that by the end of this decade we may be purchasing our telephones from IBM and our computers from AT&T. I feel the fusion of these two major technologies will give rise to ever-novel, giant technological advances as yet undreamt of.

How do universities fit into this "rapid change," given that they are slow-changing institutions?

I have to take exception to the statement that universities are slow-changing institutions.

In the area of computer science, that contention simply does not hold true. In fact, universities very often lead the way when it comes to innovative systems, software and architecture.

Hardware would not be included in this category, however, since universities are not usually in the business of fabricating large systems.

Is the hardware that universities have obsolete or up-to-date? Are university facilities suitable for training for industry?

In order to answer that, one must acknowledge, however reluctantly, the present division of universities into "haves" and "have nots." On one hand, the "haves" are in many ways superior to corporate America in terms of sophistication and innovation of systems, while falling somewhat short in "horsepower." The "have nots," unfortunately, lag behind in almost all areas — for example, horsepower, sophistication and terminal access.

The problem is further aggravated by the self-perpetuating cycle of the attraction of bright, well-motivated researchers and developers to better equipped environments.

'The most important arena in which universities can help avert Japanese dominance is in the field of artificial intelligence and expert systems . . . Our universities play vital roles in maintaining and extending the lead we hold in the development of expert systems.'

About the Interviewer

Irving S. Bengelsdorf is a technical writer/specialist at Caltech/Jet Propulsion Laboratory in Pasadena, Calif.

Bengelsdorf contributes science columns to the Los Angeles Herald Examiner *and has written newsletters, magazine articles and books dealing with popular-level explanations of science and engineering subjects. In addition, he has taught both chemistry and journalism on the college level.*

When just backing up a file has you down, the Westinghouse Disk Utility System can save you.

You don't have to swim through miles of manuals and instructions to back up a file quickly and easily. Let the Westinghouse Disk Utility System help you breathe easier.

The Disk Utility System provides comprehensive capabilities for reliable backup/restore/copy on all IBM 4300, 3030, 370 or other compatible units running in a DOS/VS(E) or DOS compatible environment. And it does it fast.

It's flexible, too. It can restore any file selectively or restore a full volume. It can relocate files, delete expired files or reorganize files. It even offers portability across device and architecture boundaries: from CKD to FBA and vice versa.

The result. You can manage your complete data files and libraries quickly and easily. And with full data integrity protection and operations security.

If a simple job is putting you under for the third time, don't let it happen again. Call us about the Westinghouse Disk Utility System. Westinghouse Electric Corporation, Operating Software Products, (412) 636-3100. For information, write us at 2040 Ardmore Blvd., Pittsburgh, PA 15221.

Westinghouse

Put your mainframe where your mouth is.

If you want to talk to a mainframe or a mini, talk to it. You don't have to talk to a computer person who talks to a computer.

ROLM Now you can go to the source. With a ROLM® Cypress™ Personal Communication Terminal.

Want your five-year plan, sales by territory, capital budget, access to the IBM SNA world, or even your favorite public data bases? That's easy.

The ROLM Cypress Personal Communication Terminal combines a digital phone with a smart computer terminal. You can prestore terminal profiles, so there is no changing settings like baud rates each time you call a different information source.

It even stores your auto log-on sequence, so calling the computer is as easy as calling home.

Now, slide in the keyboard and you're looking at the slickest, easiest-to-use executive phone in the business today. Auto-dial, customized phone functions, phone list, access to the ROLM PhoneMail™ system, a clock, calculator and more. In one beautiful package.

Keyboard disappears.

Cypress is one more happy result of the most advanced, complete, proven, problem-free business communication system in the world: The ROLM CBX.

ROLM is the choice of the top FORTUNE companies, and – increasingly – the preferred solution to digital networking. In fact, there are more than 12,000 ROLM CBXs worldwide and over 10,000 data devices communicating through ROLM systems. (That's more than all other PBX manufacturers combined.) And they're doing it now. Not tomorrow. Now.

So before you spend another day trying to talk to the people who talk to the computers, talk to us. Call (800) 538-8154. In Alaska, California or Hawaii, call (408) 986-1000, ext. 3025. Or write: ROLM, 4900 Old Ironsides Drive, M/S 626, Santa Clara, CA 95050.

ROLM. We're closing the gap between business information systems and the people who own them.

ROLM. NOW.

Managing Employee Careers

"In many cases, the only time an organization expresses an interest in its employees is when it must fill a job vacancy."

"Employees should share in setting policy and direction."

"An organization should create an environment that stimulates employees to plan."

By Michael J. Albrecht Jr.

Most people allow luck and circumstances to shape their careers. If people refuse or neglect to plan their careers, does their employer have a responsibility to do it for them? The answer is an unqualified yes — if that organization wants to ensure its own survival.

An organization should not take over career planning from its employees, but create an environment that stimulates and encourages them to plan. The task must be interactive, formally recognizing the partnership between the company and the employee.

In many cases, the only time an organization expresses an interest in its employees is when it must fill a job vacancy. This need triggers a search that may result in a career move for some "lucky" individual in that organization. Some organizations don't even spend time to search inside for a qualified candidate, but recruit from the outside, ignoring the resources already in place.

In addition to career planning, an organization has the responsibility to make certain that its members understand its basic purpose. It has the responsibility to show how the organizational structure will assist in carrying out those objectives and how each department within this structure contributes to reaching company objectives. If you agree with the premise that an organization has those responsibilities toward employees, you may ask:

1. How does a department go about developing its own objectives and functions?

IN DEPTH

2. What is the most effective way to develop a career path network that accomplishes the department's objectives and at the same time stimulates employees?

3. What framework is necessary to help employees plan their careers?

To address these questions properly, top management must be committed to employee development. Management must believe a real payoff will result when people understand what job opportunities are available to them and what their potential is.

In June 1977, I was appointed director, information systems, of a large natural gas distribution company and was forced to translate these beliefs into practice.

The department's voluntary turnover averaged around 25% and morale was low. Interviews with department heads revealed a lack of respect for information systems. The department had not implemented a new system since 1970 (seven long years), even though the need for new systems was overwhelming. Technology had bypassed long-time incumbents.

As a general rule, data processing systems retain their usefulness for six to eight years, usually not more than 10. This organization had four systems that had been in operation for 14 years plus (in 1977). The most current system was seven years old. The department had lapsed into a maintenance function, which grew increasingly complex with changes to programs and the operational environment — hardware and software.

Information systems was on a treadmill which would not only spell disaster for the department but the company as well. Local recruiters confessed that they referred only mediocre or below-average candidates to the organization because of the environment and its reputation for not doing anything that could be considered "state of the art" in data processing.

Situational Analysis

We elected to take a "total systems" approach to this problem. After many discussions with the director of human resources planning and development, information systems management laid out a comprehensive program to turn around its department. We needed to be

Tear out this coupon before someone rips off your CICS system.

Unauthorized data access and computer crime are problems you can't afford to ignore. And locks, guards and batch protection can't secure your CICS system at its most vulnerable point, your terminals.

That's why so many companies have turned to GUARDIAN, the security software so effective, it's become an industry standard.

GUARDIAN is comprehensive security. You can protect any number of users, terminals, programs, files and data bases in any combination you choose. And GUARDIAN's new techniques make it easy to define protection down to the field level.

GUARDIAN is easy to implement. Resources needing immediate protection are secure within hours of installation. It's also easier than ever to update GUARDIAN for new rules or personnel. Both temporary and permanent changes can now be made on-line. Most importantly, GUARDIAN provides reports in simple English, so it can be administered by non-technical personnel.

To find out more about the CICS security system with a proven track record, just follow the dotted line or call toll-free 800-526-0272. Don't wait.

THE COMPLETE BRANCH OFFICE

- ☑ Luxuriously furnished
- ☑ Completely staffed
- ☑ Fully equipped
- ☑ Prestigious address
- ☑ Short term agreement
- ☑ No capital investment

All included when you lease from OmniOffices.

Atlanta (404) 256-0009
Houston (713) 965-0060
Chicago (312) 843-2500
New York (212) 867-5750
Dallas (214) 233-6664
San Francisco (415) 391-8810
Denver (303) 770-1000
Washington, D.C. (703) 821-8950

Or write for brochure:
S. Wilson, Leasing Manager
OmniOffices, Inc.
5775-E Peachtree Dunwoody Rd., NE
Atlanta, GA 30342

OMNIOFFICES

For the concerned computer executive... a rare first edition.

It costs you nothing. But it details how your company can save staff time and hardware upgrades through the use of MICS, our MVS Integrated Control System.

It analyzes your installation's current environment and recommends a specific course of action for realizing these savings. It gives the names of executives like you who have taken advantage of our suggestions.

And the plan is yours for the asking. Unconditionally.

Simply direct a member of your staff to request a plan questionnaire. Have it filled in and returned to us.

We'll do the rest.

We want you to know us and MICS. To understand why 19 of the top 20 Fortune 500 industrial firms are our users. And to recognize us as the standard-setters for MVS installation management. That's why we're making you this offer.

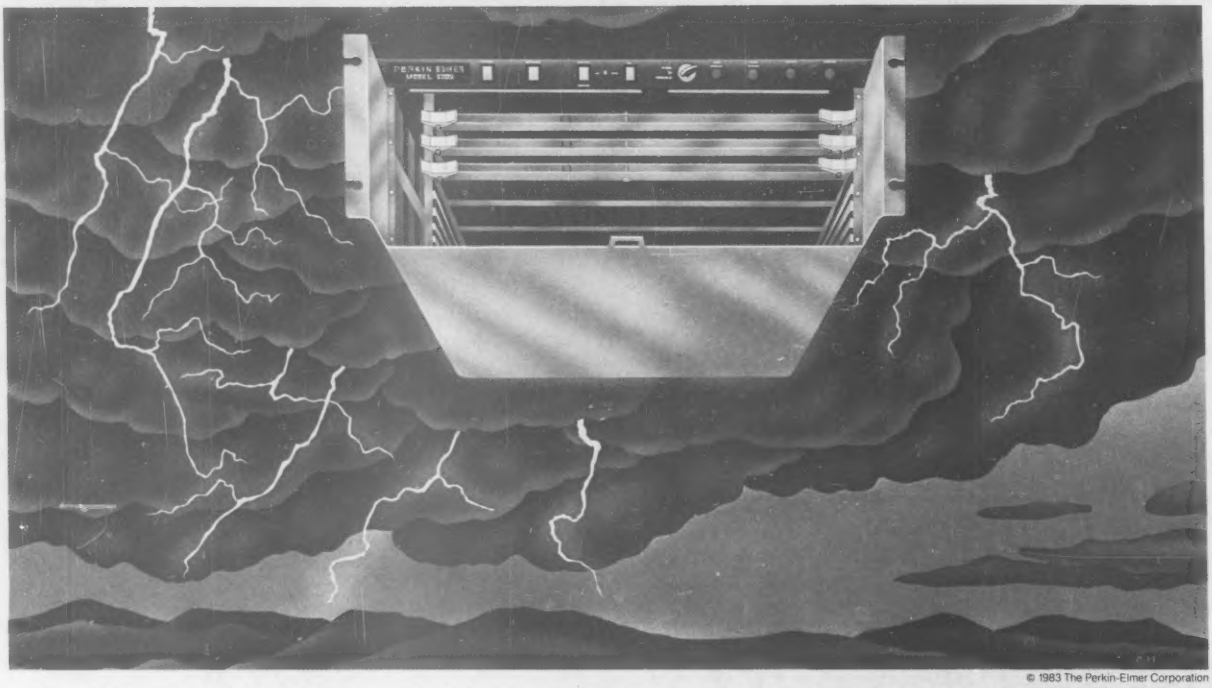
It's in the book!

MORINO ASSOCIATES

MORINO ASSOCIATES, INC.
8133 Leesburg Pike
Vienna, Virginia
22180
U.S.A.
Tel: (703) 734-9494

MORINO ASSOCIATES (UK) Ltd.
118 Victoria Street
St. Albans
Hertfordshire
England AL1 3TG
Tel: St. Albans (0727) 37464

Outpower VAX 11/730 with the lowest priced supermini–$6169.



© 1983 The Perkin-Elmer Corporation

Perkin-Elmer introduces the Model 3205. The new small-sized supermini that outpowers VAX 11/730 where it counts–Whetstones, disc capacity, and price tag.

Affordable power

Now you can incorporate 32-bit power into your system with a compact 7" high processor for only $6169 (OEM, quantity 100). 32-bit power that out Whetstones VAX by 506 to 290 and outdiscs VAX by 1.2 gigabytes to only 300 megabytes–at an entry level price that's less than half that of the VAX 11/730.

The new 3205 offers users full 32-bit power and growth capability for a wide range of tough applications. At a price even below that of less powerful 16-bit systems.

The 32-bit CPU of the 3205 is implemented on a single board with floating point capability and up to one megabyte of directly addressable memory, expandable via an additional memory board in increments of one, two, or three megabytes, for a system total of four megabytes. An additional single board provides a multiple peripheral controller and eight synchronous or asynchronous communications lines.

Reliable, compatible

The 3205 features error checking and correction memory, hardware error logger, power fail/auto restart, illegal instruction traps, CPU and MPC board self-test and remote diagnostic capability.

The 3205 is fully compatible with Perkin-Elmer's broad line of 32-bit superminis. A line that now extends from the lowest priced model available anywhere to the world's fastest (21 MIPS) supermini system. There's proven 32-bit system and third-party application software available.

System version, too

The Model 3205 is also available as a complete system. It is priced at $15,500 (OEM, quantity 100) and comes packaged with 512 KB of MOS memory, system console, power supply, 50 MB of fixed/removable Winchester disc, a selector channel, and disc controller.

To find out more about our new Model 3205 and the rest of our Series 3200 family of superminis, call or write now. The Perkin-Elmer Corporation, Two Crescent Place, Oceanport, NJ 07757. **Tel: 800-631-2154.** In NJ 201-870-4712.

PERKIN-ELMER

responsive to the organization's needs and started by completing a situational analysis, describing the problem in detail and then setting a number of objectives for ourselves:

1. Identify the information needs of the entire company, factor those needs into discrete data processing systems and prioritize those systems. Develop a long-range data processing plan.

2. Reduce maintenance to 60% of the total information systems work load and productively apply the remainder of the work force to develop new systems on a priority basis. This objective required a cost/benefit analysis system.

3. Reduce voluntary turnover by 30% within one year so that a continuity of talent could be maintained and productivity increased.

4. Improve the work environment to attract and retain people who could implement our data processing plan.

5. Improve the reputation of information systems by developing with our users a list of "products" (program fixes and enhancements) to be delivered at the end of each quarter.

6. Deliver at least one new subsystem each year.

7. Produce proper documentation that would allow us to maintain operating programs on a timely basis.

Group Sessions

We employed an outside consultant to measure the attitude of information systems personnel and to pinpoint problem areas that "blocked" people from producing desired results. Following analysis of the survey, the consultant conducted group sessions that addressed identified blockages, defined them in more detail and then listed a number of solutions. Three projects emerged from those sessions which information systems people felt would help improve the working environment (listed here in priority sequence):

1. Develop a career path program for information systems personnel. The program should allow technicians to remain in that function, but permit growth without requiring a switch to management.

2. Provide training for supervisory personnel and their subordinates to improve communications and establish a support network that would allow people to cope with a rapidly changing environment.

3. Improve the communications process between the programming group and the operations group by clearly identifying the responsibilities of each unit and by specifying the documentation requirements for production programs.

In addition, information systems developed a long-range plan based on company objectives by reviewing the company's strategic plan and interviewing top executives to determine information requirements. This plan provided the basis for our career path program.

Let me now return to the three questions raised above and describe for you how we developed answers to those questions and constructed

A communication network is as strong as its weakest link. Get the facts.

The person who plans and acquires your company's network equipment and services can make or break the chain that links your DP and OA systems.

Conference Journal

Selecting the right services and equipment requires up-to-the-minute information and practical advice about the products, issues, problems and opportunities. Now, the information you need to plan your communication network strategy is available in an exciting video format: the Conference Journal. **Communication Networks: Alternatives for the 80's** and **Local Area Networks: The Major Considerations** address the ins and outs of networking. Jointly developed by DELTAK and CW Communications, the Journals were taped on location at the fifth annual Communication Networks conference and are available only from DELTAK, the world leader in video-based DP training.

Communication Networks: Alternatives for the 80's.
In five 20-30 minute color video sessions, you'll hear from industry experts FCC Chairman Mark Fowler, former American Bell/AIS President Arch McGill and Dr. Dixon Doll, along with others, sharing their insights on topics such as short-haul microwave, PBX technology, communications processors and satellite technology.

Local Area Networks: The Major Considerations.
In this Conference Journal, data communications pioneer Dr. John McQuillan is joined by Dianna Last and Drs. Kenneth Thurber and Howard Frank. Four video sessions focus on the capabilities and architectures of LAN communications: the baseband vs. broadband debate, choosing the best system for your needs, flow control, and diagnostic network monitoring.

Plan a successful communication network. Order the Conference Journals today. To order, call DELTAK at 800.532.7686. In Illinois, call 312.369.3000.

DELTAK

CW COMMUNICATIONS INC.

IN DEPTH

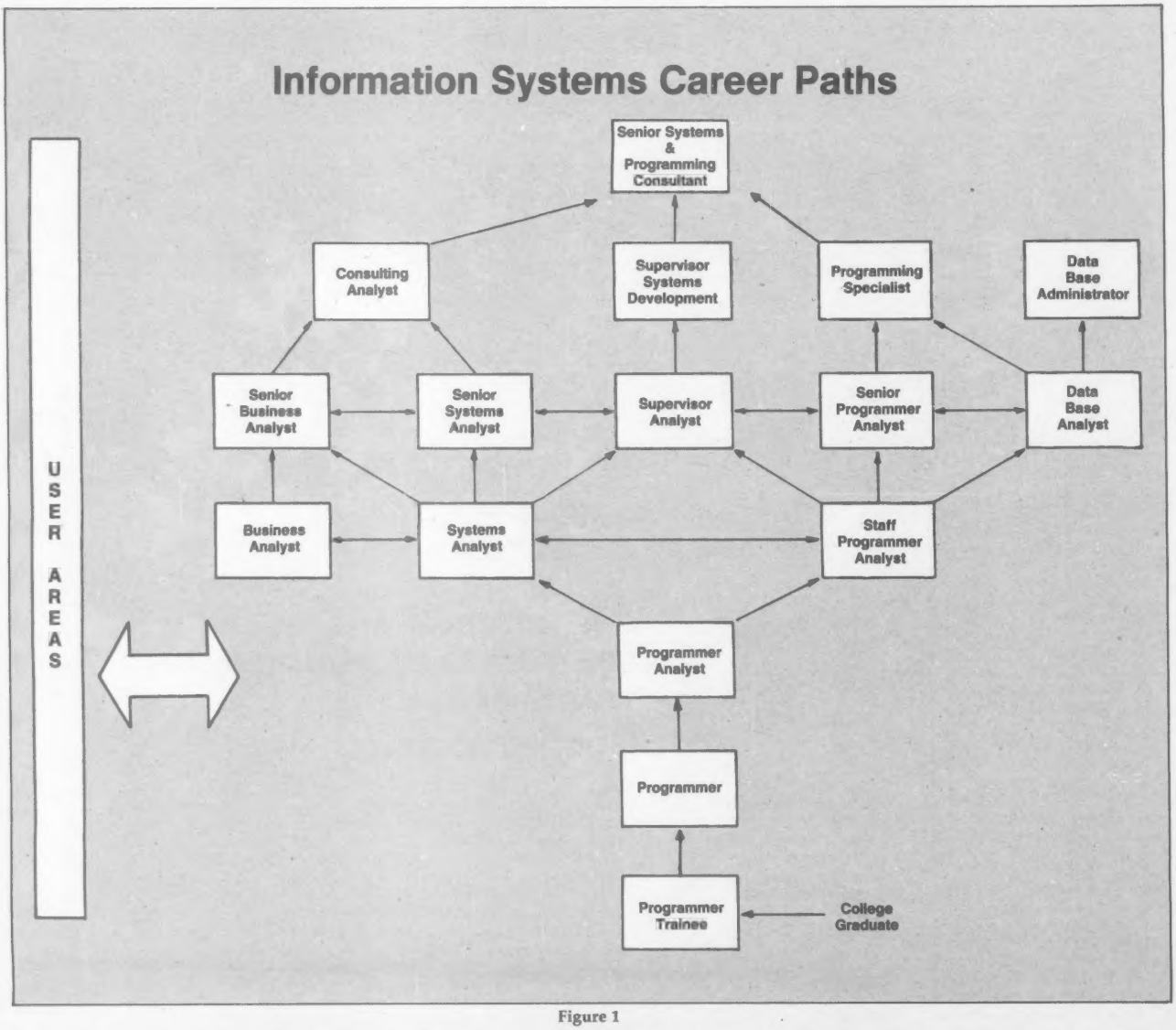


Figure 1

#1
VISICALC**
For TSO or VM/CMS
DYNACALC™**
25 TIMES FASTER THAN COMPETITION!
• Double storage capacity (Data compression)
• More mainframe features
• External file support
For a 30 day free trial call: ChicagoSoft (312) 525-6400
[priced per site, not CPU]
* Visicalc is a registered trademark of Visicorp. Visicorp is not associated with Dynacalc
** Dynacalc is owned by Dynasoft Corp

Uptime
CICS Dynamic File Allocation Facility
Dynamic file allocation eliminates CICS JCL errors as it speeds up initialization and restarts. Online files may be added or removed without interrupting your user community. Scheduling constraints are relaxed and testing becomes more convenient.
CICS Online Dump Display Facility
Formatted online transaction dumps offer immediate access to production and test abends. By reducing your problem resolution cycle, system reliability and programmer productivity is increased. User friendly commands and displays complement diagnostic test facilities.
NTEC
P. O. Box 18538 • Dallas, TX 75218
214 324-2848 • Telex 80-4294

a career development approach for the information systems department. Even though the example used is an information systems department, there is no reason why the techniques described here cannot be applied to many other types of departments.

Our long-range data processing plan and company objectives provided us with the base for developing a department mission. With a firm, well-founded direction in place, we identified career opportunities (career paths) within the department that were needed to accomplish our department objectives. This career path network turned out as follows:

The development of job families (systems analysts, business analysts, programmers, the blocks arranged horizontally in Figure 1) and the job levels for each family were identified by department management. Managers needed to assure a future to department incumbents as well as those they were trying to attract to the organization. In short, the structure had to give us a competitive edge in the job market.

Outlining Functions

Once the network was established, we asked incumbents within the different job families to identify their job functions, which fell into six major categories:

1. Information processing and technical knowledge.
2. Business and system application.
3. Project and personnel supervision.
4. Communications.
5. Management techniques.
6. Company environment and knowledge of user areas.

We took considerable time in group discussions to ensure that everyone agreed to the functions and that the wording was proper. After completing the list of functions, the groups went to work to list the skills required for each one.

In my experience, job descriptions usually intermingle functions and skills, leaving their readers confused. The groups had problems differentiating between functions and skills, tending to confuse the two. A function is a primary task, duty, responsibility or activity. Skill or knowledge is what a person needs in order to perform that function. To a lifeguard, swimming is not a job function but a skill he employs in carrying out his job function — namely rescuing people who are drowning.

In an information systems department, the same function is carried out by a number of people in different positions at different levels. In order to equitably appraise performance, the expectations have to be established by position. We decided to use five levels of performance, based primarily on the amount of supervision necessary or expected to perform a particular function, as well as the complexity of the task.

Information Systems Job Functions

Performance Standard (* = Key Function)

I. INFORMATION PROCESSING AND TECHNICAL KNOWLEDGE	Programmer Trainee	Programmer	Programmer Analyst	Staff Programmer Analyst	Systems Analyst	Business Analyst	Senior Programmer Analyst	Senior Systems Analyst	Senior Business Analyst	Data Base Analyst	Programming Specialist	Consulting Analyst	Data Base Administrator
APPLICATIONS DEVELOPMENT & MAINTENANCE													
1. Develop system and function descriptions.					3*	3*		4*	4*			5*	
2. Evaluate various system alternatives and identify the most efficient means of satisfying user needs.					3	3		4*	4*			5*	
3. Identify and define the data required to perform the system functions.					3*	2		4*	3			5*	
4. Develop system design specifications.				2	3*		3	4*			3	4	
5. Perform a quality assurance check on the system design.									3			4	
6. Develop procedural flows showing interrelationships between manual and computerized functions.						3			4			4	
7. Develop procedural flow showing operation of designed system.					3			4				4	
8. Determine the most efficient means of providing specified data to satisfy the user functions.		1	2	3*	3*	3	4*	4*	3		4*	4	
9. Determine the requirements for data entry verification of system input.			1	2	2	2	3	3	3		2		
10. Define inputs, outputs, files and storage medium and document the steps required to process the data.		2	3*	3*	3		4*	4			3	3	
11. Develop manual controls and other user procedures that are related to the system design.			1	2	2	3	3	3	4		2	4*	
12. Develop backup methods and procedures to cover conceivable contingencies.			2	3	3		4	4*			4*	4*	
13. Prepare an implementation plan that considers technical requirements and restrictions.			2	3	3*		4*	5*			4	4	
14. Assure that proper testing procedures are followed during all stages of system development, ranging from program module testing up to full system and acceptance testing.				2	3		4*	4*				4	
15. Prepare a conversion plan that covers user and data processing requirements including methods and procedures, timing and detail schedules.					3	2*		4	3*			4	
16. Prepare a cost analysis of a project.					3	3		4	4			4	
17. Prepare a cost analysis of the technical aspects of a project.			2	3			4*			3	3		4
18. Evaluate requests for major system changes and enhancements.				1	3*	2	2*	4*	3	2	3	4	5

Key to Grading System:

1 — Performs under direct supervision in easy to moderately difficult tasks.
2 — Performs moderately difficult tasks with some supervision.
3 — Performs complex tasks with limited supervision.
4 — Is fully competent to perform most tasks without supervision.
5 — Performs tasks without supervision. Others seek his advice.

Figure 2

The five levels of performance we developed are as follows:

1 — Performs under direct supervision in easy to moderately difficult tasks.

2 — Performs moderately difficult tasks with some supervision.

3 — Performs complex tasks with limited supervision.

4 — Is fully competent to perform most tasks without supervision.

5 — Performs tasks without supervision. Others seek his advice.

Our result can best be shown by a sample matrix we developed for one of the categories of functions. Figure 2 shows a job function/performance standard matrix for the "information processing and technical knowledge" category. The asterisks indicate that a particular function is key to that position and will be considered in assessing a candidate's readiness for promotion.

We then developed a similar matrix to emphasize the skills necessary to perform identified job functions (see Figure 3 on In Depth/30). A

Overworked? Get these DOS/VS(E) and CICS/VS labor savers!

Our program products help your systems people do more work with less effort, at a cost that's surprisingly lower than comparative methods. Use them alone or in combination.

BIMSPOOL retrieves batch prints from POWER/VS queue and prints on 3270-type terminal printers.

BIMSPOON creates batch prints from CICS application programs.

BIM-ODIS determines CICS status and operational or performance problems.

BIMSUBMT edits and submits jobs on-line.

BIMTEXT creates formatted documents from free-form input.

BIMCMPRS compresses 3270 transmissions reducing response time.

BIMDSLOG reviews DOS/VS messages without tying up system controls.

BIMSERV displays directories and entries in all DOS/VSE libraries, VTOC's and VSAM catalogs.

BIMMONTR: DOS/VSE System status, performance measurement, POWER/VSE queue and entry CRT display system.

BIMDEVC displays device assignment status.

BIMP3270: CRT print program, routes full screen image to terminal or system printers.

New products are under development for release soon. We also offer experienced systems programming consultation nationwide, with bases in Minneapolis and Washington D.C.

All BIM products come with a 30-day free trial, so you can see just how much labor the programs really save — without any financial risk. Full documentation is also available on request.

BIM program products are already successfully at work in 12 countries. Phone or write us to find out how they can help you.

BIM

B I MOYLE ASSOCIATES, INC
4355 Lyndale Ave. S. Minneapolis, MN 55409
612/822-2661 Telex 290 123
Member Independent Computer Consultants Association

The next millennium begins in the year 2000.

Nearly two decades ago, our industry took on the formidable task of writing faster, more powerful, more user-oriented software than users themselves could create. Vendors did this by isolating each specific business application—such as general ledger, accounts payable and fixed assets—and developing the best specific programs and commands for each one.

McCormack & Dodge was in the forefront of this movement, leading the way with its Plus series: G/L Plus, A/P Plus, F/A Plus—systems so advanced they became the choice of the world's most advanced companies. In a market competing to produce separate products for separate applications, they became known as the most competitive products of all. Benchmarks of sophistication.

The reason was research. Since its founding, McCormack & Dodge has been a research-driven company. To enhance our packages, we have always urged researchers not to simply look ahead—but to look ahead regardless of the outcome.

Four years ago, a team of top McCormack & Dodge researchers began to question the fundamental assumption under which all major software vendors were competing, including ourselves. Why, they asked, must borders exist between business systems? Why not common programs and commands for all applica-

McCormack & Dodge Corporation, 1225 Worcester Avenue, Natick MA 01760.

For McCormack & Dodge users, it begins today.

tions? Why not a real-time integrated environment for all of a user's software systems? So that a person asking a question in one system might instantly enter a correction in another, seek an answer in a third, update a fourth—moving freely through the entire vast information universe, a universe unencumbered by boundaries, walls, separations. Where time would be real-time. Where delays would be a thing of the past. Of the previous millennium.

We are proud to announce a new millennium. And we are eager to introduce you to our new Millennium business software. The software of tomorrow. Today.

Sales and support offices throughout North and South America, Europe, Asia, Australia and Africa.

Introducing Millennium. Tomorrow's software today.

- ☐ General Ledger
- ☐ Accounts Payable
- ☐ Fixed Asset Accounting
- ☐ Payroll/Personnel
- ☐ Purchase Order Management
- ☐ Capital Project Analysis

For IBM mainframe systems.

(800) 343-0325*

*Telex: 710-325-0329

McCormack & Dodge

a company of The Dun & Bradstreet Corporation

IN DEPTH

Career Path Knowledge, Skills

Skill Level (* = Key Skill)

BUSINESS AND SYSTEMS APPLICATIONS	Programmer Trainee	Programmer	Programmer Analyst	Staff Programmer Analyst	Systems Analyst	Business Analyst	Senior Programmer Analyst	Senior Systems Analyst	Senior Business Analyst	Data Base Analyst	Programming Specialist	Consulting Analyst	Data Base Administrator
1. General knowledge of a variety of industry applications.					2	2		3	3			4*	
2. General knowledge of the major applications of the company and the functions performed.			1	2	2*	2	3*	3*	3	3	3	4*	3*
3. General knowledge of the system software installed at the company and the functions performed.		1	2	3	2		4*	3*		3*	5*	4	4
4. Knowledge of individual applications' use of the corporate data base.					2		2	3		3*	2	3	4*
5. Knowledge of the system functions, processing features and I/O requirements of the applications in your area of responsibility.	1	2*	3*	4*	3*	3*	4*	3*	3*	3	4	3	3
6. Ability to answer questions about present system functions and general processing features.		1	2*	3*	3	3	4	4	4		4	3	
7. Ability to identify the data and processing features required to satisfy a user request.	1*	2*	3*	4*	3	2	5	4	3	3	3	3	3
8. Ability to identify and evaluate the impact of proposed major changes to the present system functions and processing features.			1	2	2*	2	3*	4	3	3	3	4	3
9. Ability to evaluate efficiency and effectiveness of systems.					2	3*		3	4*			4*	
10. Ability to develop effective user training material.					2	2		3	4			3	

Key to Skill/Knowledge Levels:

1 — Exposure
2 — General
3 — Working
4 — Thorough
5 — Expert

Figure 3

different scale had to be used to properly assess skills or knowledge levels. We developed, again, a five-point scale:

1 — Exposure.
2 — General.
3 — Working.
4 — Thorough.
5 — Expert.

An asterisk was assigned to those items deemed critical to that position.

The teams of job incumbents developed 104 functions and 69 skills as their final product. These matrices were then used to develop job descriptions.

The job descriptions followed a company format, but did not change the wording of functions and/or skills. Of course, only appropriate functions and skills, properly delineated, appeared on each position description.

Throughout this process, interim products were reviewed by information systems management and by the rest of the department. Corrections were only made when necessary.

By the end of this process, all members of the department had a very good understanding of our directions, what we wanted and had to accomplish, the functions we performed to achieve our objectives and the career path available to them.

Rating Scales

Management, however, felt uncomfortable. The work we had done to identify the job each position was expected to perform could not readily be evaluated with the company's performance appraisal forms, which were very general and, in most cases, did not relate to functions performed by information systems people.

When we discussed this dilemma with the director of human resources planning and development, he suggested we develop behaviorally anchored rating scales (Bars) for each one of our positions. With his guidance, we used a process called "retranslation of expectations" to develop a performance measurement tool for each position that had incumbents. This procedure consisted of the following steps:

1. Job-knowledgeable individuals (position incumbents) generated examples of effective and ineffective job behaviors.

2. These behaviors were then sorted into the six job categories discussed above.

3. A second group of raters was given the behaviors and the job dimensions and was asked to re-sort the behaviors into the same categories. Behaviors that did not end up in the same categories as initially sorted were eliminated.

4. The remaining behaviors were rated from 1 to 5 in terms of effective to ineffective behavior: 5 for "outstanding," 4 for "exceeds requirements," 3 for "meets requirements," 2 for "meets minimum requirements" and 1 for "does not meet requirements."

5. Behaviors with a large variability in their ratings were eliminated.

6. A subset of the behaviors is used as a descriptive example for each scale point. In using the scale, the rater was asked to select which set of behaviors the individual performed during the rating period.

Positions with no incumbents could obviously not be "fitted" with a Bars performance appraisal form. Once people moved into the position, we used a management-by-objectives approach until we had enough experience to develop the Bars scales.

With the career path — the job

If you're thinking of word processing for your DEC PRO,

Wait!

Because WORD-11™, the most widely used word processing system for DEC PDP-11™ and VAX™ computers, is coming for the DEC PRO-350™. From DPD, naturally.

Data Processing Design, Inc.

181 W. Orangethorpe, Suite F, Placentia, CA 92670 714/993-4160

Software reliability, who cares?

Who cares?! You care! Because reliable software solutions mean greater confidence and fewer headaches.

At MCBA, we care enough to see that our applications are continually enhanced to meet user needs. We quality-assure our products with rigorous testing. And we stand behind them with responsive service and support.

Here's what satisfied users and resellers of MCBA applications have to say:

"From the viewpoint of reliability, MCBA packages get a very high rating. I think the main reason is that MCBA is constantly going through their programs and correcting them and improving them as needed. That kind of support is often not available with other software."
Charles E. Thomas, President
Computer Techniques and Information, Phoenix, Arizona

"I'm very impressed with the MCBA system that we have. It works every single time. I've recommended it to many people."
Susan Power, Manager of Data Processing
SMC Pneumatics, Inc., Indianapolis, Indiana

"We have found that the MCBA packages meet our requirements better and are more bug-free than other comparable packages. We've been installing them for quite a broad range of users, and they are all very satisfied."
Dennis Henderson, President
S-Cubed Business Systems, La Jolla, California

11,000 users worldwide know they can rely upon MCBA software to save them time and money in their businesses. You can, too. Because at MCBA, we care about reliability.

Reseller inquiries invited.

Mini-Computer Business Applications, Inc.
2441 Honolulu Avenue, Montrose, California 91020
Telephone: (213) 957-2900 Telex: 194188

MCBA®

☐ I care.

Please send me free information for the MCBA applications I've checked below:

Digital Equipment (PDP®-11 and VAX®—DIBOL®):
☐ Accounting and Payroll ☐ Distribution
☐ Manufacturing ☐ Professional

Texas Instruments (DS990 and Business Systems—COBOL):
☐ Accounting and Payroll ☐ Distribution

Wang Laboratories (WANG VS—COBOL):
☐ Accounting and Payroll ☐ Distribution

Hewlett-Packard (HP 3000—COBOL II with IMAGE):
☐ Accounting and Payroll

Name _____
Title _____
Company _____
Address _____
City _____ State _____
Zip _____ Country _____
Phone (_____) _____ ☐ Call me immediately.
I am a Hardware OEM ☐; Software Reseller ☐; End User ☐; Consultant ☐;
Other _____

CW 81583

IN DEPTH

functions and the associated skills and knowledge requirements — and the performance appraisal in place, we turned our attention to a tool for career planning.

The performance appraisal identifies skill weaknesses that need to be shored up and provides the basis for the career development plan. After each performance review, the supervisor and employee discuss what has to happen before the employee can be promoted to the next level within his current job family. With the help of a newly developed training guide, courses, seminars and job experiences are outlined for the next six to 12 months.

The training development guide also lists the base requirements for each position and gives an individual the opportunity to start work in getting to a different job family. This opportunity, of course, is dependent on the organization's need for additional people in that area.

It must be pointed out that this career development program takes time and resources and, above all, a strong management commitment. However, a quality result will pay off handsomely for the organization. In our case, we reduced turnover by 40% in one year.

The work in setting up the program, in itself, told informations systems people that management was serious about employees.

We created an important communications tool — our long-range plan. This document was reviewed with the entire information systems staff, along with a discussion by each information systems manager as to what his group was expected to produce over the next year. People knew where the department was going and what new projects and technologies would be implemented. They could see how the career path network (Figure 1) supported this plan and, most important, they could see alternate career paths within the department.

Realistic Evaluation

This system provides the employee with a realistic evaluation of performance. The Bars system gives the individual very specific examples of job effectiveness. After a performance evaluation, the supervisor discusses with the employee what training he needs over the next six to 12 months and what job experiences he will be exposed to during that period. This discussion is documented and passed on to the next level of management. Training is provided through outside seminars and/or a very extensive audio-visual education program.

The supervisor discusses alternative career options with the employee if he is not completely satisfied with the work in his present job family. Of course, the needs of the organization are taken into consideration at this point. If an employee wants to move into an area that is up to budgeted levels, he is blocked until a vacancy occurs.

However, training goals can be set with the supervisor so that the employee can learn the required skills, and his request can be considered when an opening develops. Jobs are filled based on merit.

In addition, the work also improved the group's morale. In one year, attitude scores on a number of scales pulled even with national norms and, in some cases, exceeded those scores.

Our recruiting effort received a shot in the arm because we were able to show new employees where we were going and what opportunities were available.

This kind of career development program allows employees to buy automatically into the objectives of the organization. Employees share in setting policy and direction.

Separation becomes much more painful.

About the Author

Michael Albrecht Jr. is president of M. Albrecht Jr. & Associates, Inc., a management consulting firm based in Grosse Pointe, Mich. The company specializes in corporate long-range planning, data processing and organizational behavior.

Albrecht formerly worked for IBM as a marketing representative and an instructor in its Customer Executive Education Program in Poughkeepsie, N.Y.

See the latest in microcomputers — from Apple to Wang* — at EMCE Long Beach this October.

If you're involved with business use of microcomputers, then EMCE is the microcomputer conference and exhibition designed exclusively for you.

At EMCE, you'll see the latest in microcomputer systems, business software packages, printers, monitors and other peripheral equipment, computer accessories and related services. And you'll be able to meet face to face with computer professionals on an exhibit floor full of microcomputer products from leading hardware and software companies.

EMCE also offers you a complete conference program which will be held Thursday and Friday with special tutorials to be held all day on Wednesday.

Put EMCE on your calendar now! The Long Beach Convention Center in Long Beach, CA is the place; Wednesday, October 5 through Friday, October 7, 1983 are the dates. Exposition hours: 10-6, Wednesday through Friday.

If you're interested in exhibiting at EMCE contact Doris Rosner, Mitch Hall Associates, 1200 East Street, Westwood, MA 02090, (617) 329-8334.

Or, if you'd like more details on the conference program, contact Louise Myerow, CW Conference Management Group, Box 880, Framingham, MA 01701, (800) 225-4698. In Massachusetts, call (617) 879-0700.

*Just two of the many manufacturers represented at EMCE New York in June.

EMCE
Executive Microcomputer Conference & Exposition

The Executive Microcomputer Conference & Exposition is sponsored by the Conference Management Group of CW Communications/Inc., publishers of Computerworld, InfoWorld, ISO WORLD and PC World as well as information systems publications in 21 countries around the world.

First User of Northern Telecom's SL-1

Bank Integrates Voice, Data With PBX

MINNEAPOLIS — The First Bank of Minneapolis became a pioneer in integrating voice and data commercially on a private branch exchange (PBX) when, in 1978, it planned a major expansion and remodeling of its downtown complex.

Requirements for communications system that would handle both voice and data lead the bank to purchase one of the first Northern Telecom Inc. SL-1 PBX systems.

The telephone system also had to serve the corporate headquarters of First Bank System, a multibank holding company with assets of over $17 billion, of which First Bank Minneapolis is the largest bank.

Established in 1857, First Bank Minneapolis is one of the top financial institutions in the Midwest. The bank had 1982 year-end assets of $5.5 billion and employs 1,900 people. Nineteen eighty-two was also the sixth consecutive year of record earnings for the bank.

Several companies were considered in the selection of the communications system. The contract went to Collins Communications Systems, Inc. for the SL-1 digital business communications system. The SL-1 system installed at the First Bank complex currently connects 2,300 telephones and can grow to up to 4,000 telephones.

The SL-1 Add-On Data Module

"The SL-1 best suited the equipment requirements for the bank at the time," George Holthus, vice-president planning at the First Bank, said.

"The ability of the product to handle voice and data concurrently on the same phone line, using a device called an Add-On Data Module (ADM), was a factor in the decision. Not all

(Continued on Page 70)

Processor Said To Emulate IBM 3274-51C

MIAMI — Innovative Electronics, Inc. has announced a communications processor said to emulate an IBM 3274-51C communications controller running Configuration Level A.

The MC-80/6000-1 communications processor reportedly converts a Digital Equipment Corp. VT100-compatible terminal into a full-function IBM 3277-1, 3277-2, 3278-2 terminal communicating with the IBM host using the Binary Synchronous Communications protocol.

The communications processor reportedly performs full screen mapping; data displayed on an asynchronous Ascii terminal will be the same as an IBM 3277/3278 display station, with virtual screen sizes of 480, 960 and 1,920 characters, a vendor spokesman said.

The stand-alone processor provides two serial communications ports.

Priced at $1,495, the processor is available from the vendor at 4714 N.W. 165th St., Miami, Fla. 33014.

Terminal Emulator Out for IBM Micro

LOS ANGELES — Inner Loop Software, Inc. has introduced a terminal emulator for the IBM Personal Computer that reportedly allows the micro to be used in place of the Hewlett-Packard Co. HP 2624, the HP 2648 and the Digital Equipment Corp. VT52 video display terminals.

Video Display Terminal Emulator (VDTE) 2 reportedly features a general-purpose file transfer system that requires no special programming on most host computers to transfer Ascii files, according to a vendor spokesman.

VDTE 2 supports HP 2624B block mode for compatibility with most HP 3000 software and a subset of HP 2648A vector graphics plotting sequences, according to a spokesman for the vendor.

VDTE 2 is reportedly written in assembly language especially for the IBM Personal Computer. Both serial ports can be used, with seven pages of off-screen scrolling memory per port, a vendor spokesman said.

Priced at $200, VDTE 2 is available from Inner Loop Software, through P.O. Box 45857, Los Angeles, Calif. 90045.

NCR Comten Expands 7160 Series Modems

ST. PAUL, Minn. — NCR Comten, Inc. announced that it has expanded its 7160 series of IBM Systems Network Architecture (SNA)-compatible diagnostic modems with the introduction of the Comten 7165, a 9,600 bit/sec modem that is available in point-to-point and multipoint versions.

The modem is said to be fully synchronous, to operate over unconditioned, voice-grade lines in full-duplex mode and to feature built-in diagnostics and compatibility with IBM mainstream diagnostics.

NCR Comten said the modem uses digital signal processing for 98% of its functions, includng modulation, demodulation and dynamic equalization.

Available for shipment Sept. 15, unit prices start at $5,800, according to the vendor. NCR Comten is located at 2700 Snelling Ave. N., St. Paul, Minn. 55113.

CLIP AND RETURN FOR FAST RESPONSE

300 BAUD
103A COMPATIBLE

$147
☐ MODEL 305E2-12

MODEMS
WITH ALL THE FEATURES YOU NEED
FULL DUPLEX EIA RS232C INTERFACE
INTEGRAL VOICE / DATA SWITCH ALLOWS USE WITH ANY MODULAR TELEPHONE
CAN BE USED ON DIAL NETWORK OR TWO WIRE PRIVATE LINES
212A HAS MANUAL ORIGINATE / ANSWER SWITCH; 103A IS ORIGINATE ONLY

1200 BAUD
212 A COMPATIBLE

$377
☐ MODEL 212E2-32

☐ Acoustic Couplers ☐ Models ☐ Line Drivers ☐ Accessories
☐ Statistical Multiplexers ☐ Protocol Converters

Please check items of interest and return to us for additional information

name _____
company _____
street _____
city _____ state _____ zip _____
telephone _____ ext. _____

ComData
We can get you there from here.
7900 N. Nagle
Morton Grove, IL 60053 312/470-9600
New York 212/690-7727
Los Angeles 213/622-0334
member of IDCMA

IBM Unveils Resource Manager

PORT CHESTER, N.Y. — IBM has announced the Resource Manager for its 4700 Finance Communication System.

The Resource Manager includes two programs providing a series of programming aids said to help reduce the time required to develop new applications and improve programmer productivity.

The programming aids include the Controller Resource Manager, which operates on the 4700 controller and manages the components of the branch system, including terminals, printers and storage files, and IBM's Application Map Generator.

Available in late December, the Controller Resource Manager carries a one-time charge of $1,300; the Application Map Generator has a one-time charge of $21,000. More information is available from IBM at 900 King St., Port Chester, N.Y. 10573.

ATTENTION System/34-38 Users

"We're more cost-efficient in all areas. Management is easier with Access Telecom." President and CEO

"Our sales people talk directly to the IBM System for orders and customer service." V.P.—Sales

"We have better quality and inventory controls by going right to the computer." V.P.—Production

"My word processor works with IT."

"My work station works with IT."

"I enter data on my touch tone phone with IT."

"My Telex entries are automatic with IT."

Let Access Telecom be a hero in your organization.

Access Telecom offers integrated hardware-software products—ACCESS/34/38—which provide interactive asynchronous communications with the IBM System/34 and System/38.

Access Telecom

60 Shorn Drive • Burr Ridge, IL 60521 • Call 312/920-7920

This advertisement is not an offer to sell nor a solicitation of an offer to buy these securities. The offering is made only by the Prospectus.

NEW ISSUE

1,452,500 Shares

ZIYAD

COMMON STOCK

Price $14 Per Share

Copies of the Prospectus may be obtained from any of the several Underwriters only in such states in which such Underwriters are qualified to act as dealers in securities and in which the Prospectus may be legally distributed.

Hambrecht & Quist Incorporated — E. F. Hutton & Company Inc.

Bear, Stearns & Co. — The First Boston Corporation — A. G. Becker Paribas Incorporated

Blyth Eastman Paine Webber Incorporated — Alex. Brown & Sons — Dillon, Read & Co. Inc.

Donaldson, Lufkin & Jenrette Securities Corporation — Drexel Burnham Lambert Incorporated — Goldman, Sachs & Co.

Kidder, Peabody & Co. Incorporated — Lazard Frères & Co. — Lehman Brothers Kuhn Loeb Incorporated

Merrill Lynch Capital Markets — Prudential-Bache Securities

L. F. Rothschild, Unterberg, Towbin — Shearson/American Express Inc.

Smith Barney, Harris Upham & Co. Incorporated — Wertheim & Co., Inc.

Dean Witter Reynolds Inc. — Cable, Howse & Ragen

Robertson, Colman & Stephens

August 3, 1983

Modem System Boasts V.29 Compatibility

SILVER SPRING, Md. — Rixon, Inc. has introduced the RV.29/2 full-duplex, V.29-compatible synchronous 9,600 bit/sec point-to-point modem system.

The modem includes an integral line contender said to allow a single terminal or two adjacent terminals to share one 3002 unconditioned four-wire private line. Normally operating at 9,600 bit/sec, the modem can also operate at a fallback rate of 4,800 bit/sec.

The Rixon LSD-6C Line Saving Device can also be used with the modem for applications requiring more than two adjacent terminals.

The modem's front panel contains push buttons that permit testing of the modem, the terminal and the line, according to the vendor. The operating speed is also controlled by a push button.

Priced at $2,495, the modem is available from Rixon at 2120 Industrial Pkwy., Silver Spring, Md. 20904.

System Allows IBM Micro To Emulate Burroughs Unit

CINCINNATI — Intercomputer Communications Corp. has announced software said to allow the IBM Personal Computer to emulate the Burroughs Corp. MT983/TD830 terminal.

Intercom 100 reportedly supports up to six addresses simultaneously — four for concurrent operator dialogues or bidirectional file transfers and one for background printing. The additional address is reserved for future upgrade.

Other features include an on-line disk file transfer utility, data communications line monitor mode and data transfer rates from 50- to 9,600 bit/sec using the standard IBM asynchronous communications adapter or equivalent.

System requirements are one disk drive, at least 64K bytes of memory and an asynchronous card. Intercom 100 is available immediately on a 5¼-in. diskette at $99 per copy, with a 30-day money-back guarantee from Suite 2A, 3195 Linwood, Cincinnati, Ohio 45208.

Victor Offers Two Options As ECR Link

ATLANTA — Victor Technologies, Inc. has introduced two communications options to link the company's Vanguard Electronic Cash Registers (ECR) into a single retail system.

Both options are said to provide consolidation of totals and price changes — one by linking registers in a store to a master register, the other by linking them to a Victor 9000 desktop computer, according to a vendor spokesman.

The Inter-Terminal Communications (ITC) option is available to link up to 255 Vanguards to a single master vanguard, on up to 4,000 feet of cable. In addition, Vanguard ECRs can now also be linked to the Victor 9000 with a field upgrade, according to a vendor spokesman, allowing the Victor 9000 to poll information from up to 255 Vanguard units.

The price of the Victor 9000 starts at $3,495. For the function as a master to the registers, a Register Interface Board is required; this upgrade costs $350. As with the ITC option, each Vanguard on the network requires a utility board and hardware interface, priced at $300.

More information is available from Victor at 380 El Pueblo Road, Scotts Valley, Calif. 95066.

Bytronix Out With Mux

FULLERTON, Calif. — A dual-mode multiplexer providing up to 16 channels of I/O in standard Data General Corp. DG4060 or microprocessor-controlled direct memory access modes has been announced by Bytronix Corp.

The B108/B116 Maximux boards, the vendor said, are designed primarily for Bytronix or other DG-emulating computer systems.

Packaged on a 15- by 15-in. circuit board, the B108 provides eight channels of I/O multiplexer. The B116 expands to 16 channels; a second board may be added for expansion to 32 channels. Each channel has programmable bit/sec rates in 16 steps from 50 bit/sec to 19.2K bit/sec.

List prices are $1,945 for the B108 and $2,475 for the B116. Delivery time is said to be 30 days. Further information is available from Bytronix at 2701 E. Chapman Ave., Fullerton, Calif. 92631.

Facility Enables IBM Micros To Work With IBM CPUs

PHILADELPHIA — Cisinetwork Corp.'s Uni-Coll Corp. subsidiary has announced a software package said to enable IBM Personal Computers to upload and download data from an IBM mainframe.

Called C-N-Comm, the facility reportedly uses an error-checking protocol to assure data integrity during the transfer process. It can be installed in any IBM mainframe environment that supports MVS with TSO.

C-N-Comm runs on an IBM Personal Computer with 128K bytes of random-access memory, at least one single-sided disk drive and DOS Version 1.1 or 2.0.

The package is priced at $400 per copy. A fully paid license costs $5,000, including one year of maintenance, Uni-Coll said from 3401 Science Center, Philadelphia, Pa. 19104.

Aid Offers Networking For Micros

FALLS CHURCH, Va. — TAU Systems Corp. has announced software said to allow global networking of personal business computers using the telephone system.

A network based on I/O Express reportedly may include up to 149 remote computer stations within reach of the telephone system. The product is designed to overcome protocol incompatibilities at various sites, allowing micro-to-micro and micro-to-mainframe network configurations without hardware protocol conversion.

The product also offers a point-to-point protocol said to compress automatically data files prior to transmission, reducing telephone connection time. Other features include channel selector access to the remote station, automatic logon, menu-driven command selection and automatic batch file transfer.

I/O Express costs $395 per workstation and runs under Digital Research, Inc.'s CP/M operating system, a spokesman said from Suite 327, 7115 Leesburg Pike, Falls Church, Va. 22043.

Alarm Unit Out For IBM 3270s

EAST NORWALK, Conn. — Datacomm Management Science, Inc. has introduced an alarm unit that can reportedly be installed on any IBM 3270 or compatible CRT terminal or line printer to signal the arrival of urgent messages.

The AAD-8 Alarm Attachment Device reportedly produces an audible signal and activates an LED alert light when the system recognizes a preestablished character code in the incoming header, a vendor spokesman said.

At a cost of $500, the alarm system is available from Datacomm at 25 Van Zant St., East Norwalk, Conn. 06855.

From AT&T Information Systems

Com Key, Horizon Get Price Cuts

MORRISTOWN, N.J. — AT&T Information Systems, Inc., formerly American Bell, Inc., has announced a 20% price reduction on its Com Key 416 and Horizon VS communications systems.

The Com Key, designed for smaller businesses, is a key telephone system with a built-in loudspeaker that reportedly enables a system to handle up to four common lines and 16 stations.

The Horizon is a multi-button electronic telephone set that can reportedly handle up to 32 lines and 79 extensions simultaneously and includes three-way conferencing, call waiting and call transfer.

The price reduction amounts to a difference of some $560 on the average four- to six-station Com Key system, with a current purchase price of $2,800, and a reduction of about $3,800 on the average 10-line, 20-station Horizon VS system, with a new purchase price of $19,000, according to a spokesman for the vendor.

Additional information can be obtained from AT&T Information Systems through Box 1955, Morristown, N.J. 07960.

Develcon
has a sweet offer

for datacomm distributors who are the cream of the business:

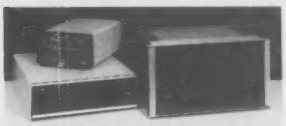
Develcon data transmission products . . . cream always goes to the top.

The Develcon data transmission products line.

We're moving up quickly, and we'd like you to join with us. For the first time, Develcon is setting up a nationwide distributor network to market data transmission products which include a full line of limited distance data sets and statistical multiplexers. Our products are top quality and highly competitive. They offer outstanding growth potential for quality datacomm products distributors.

If you serve our markets with compatible products, provide first class service to your customers, and can also analyze customers' overall data communications needs, we'd like to talk with you.

Contact John D. Roberts, national distributor sales manager at (215) 348-1900 today for full details. He'll be pleased to describe our products, our company, and all of our support services to help make your selling job easier and more productive.



Our statistical multiplexers provide error-free transmission at speeds up to 19,200 bps, with concentration ratios up to 9 to 1. Models are available from 3 to 52 channels, and 64K bytes of memory. Prices start at $1550.

Develcon limited distance data sets provide synchronous or asynchronous operation from 1200 to 19,200 bps, over private wire lines or switched networks. Prices range from $95 to $1100, depending upon models, and all are offered with a two year warranty.

Develcon ELECTRONICS

DEVELCON ELECTRONICS, INC.
4037 Swamp Road
Doylestown, PA 18901
Telephone: (215) 348-1900
Telex: 84-6389

Develcon Electronics is a leader in data communications technology. We are manufacturers of a complete line of data sets, intelligent switching equipment and network systems.

The same, identical software you develop for our largest HP3000 can run on our smallest.

Most companies need a range of business computers. What they don't need is the high cost of converting software to run on the different systems.

With the HP 3000 family, that cost is zero. Because we never change its compatibility, even though we're constantly expanding its performance.

Without rewriting a word of code or recompiling, you can use the same programs right up the line. From our inexpensive Series 39 that can serve a single user in a branch office. To our Series 68 distributed mainframe that can handle 400 in your regional headquarters.

That frees you for more productive things like reducing that applications backlog. Here again, the HP 3000 can help dramatically.

Its special programmer productivity tools have cut months off program development schedules. And, with our long list of off-the-shelf software packages, there are many programs you may not have to write at all.

And vice versa.

But your savings actually start with the hardware. The HP 3000 family delivers equal performance for up to 40% less than comparable systems. And their flexible communications make it easy to build local and remote networks, as well as links to IBM, one step at a time. You get what you need now. Then add more as you grow.

Small wonder the HP 3000 is one of the most popular business computer families in the country. If you'd like to see it in action, call the nearest HP office listed in the white pages. Ask for a Business Computer Specialist. Or write to Tom Rappath, Hewlett-Packard, Dept. 03183, 19447 Pruneridge Avenue, Cupertino, CA 95014. In Europe, write to Henk van Lammeren, Hewlett-Packard, Nederland B.V., Dept. 03183, P.O. Box 529, 1180 Amstelveen, The Netherlands.

HEWLETT PACKARD

BD02302

Northern Telecom's SL-1 Meeting Bank's Needs

(Continued from Page 65)

our computer terminals use ADMs, but more will in the future."

The ADMs are installed between the telephone set and the data terminal. In such a configuration, the user can make voice calls on the SL-1 electronic set and data communication transactions on the terminal individually or simultaneously.

The Bank's communications system is one of the most extensive in the country in terms of the features incorporated. It uses an automatic route selection program, call detail recording and tie lines to provide various member banks or affiliates access to long-distance services.

There is a high percentage of SL-1 electronic telephone sets using speed call, call forwarding, ring again and other productivity-enhancing features. These are features which only a few years ago were considered by many to be optional, but today are expected capabilities of an electronic PBX.

The data terminals connected via ADMs can also use many of these voice features. Services such as off-premise data centers can be accessed using speed call and busy lines can be queued against, using the ring again features.

With the SL-1 and ADM, if there is a phone jack at the new location, the telephone, terminal, and ADM are lugged into the new jack.

"We had a phased installation of the system over 24 months, and the ADM was available when needed," Holthus continued. "In April of 1982, we installed our first Hewlett-Packard 3000 data processing system in the financial planning department; another HP 3000 was installed in the data processing department in August."

"The communications system at First Bank is typical of a major company using the newest technology to answer and anticipate communication needs," said David Crawford, executive vice-president, Collins Communications. "Currently there are about 40 ADMs installed on the system. These handle asynchronous data transfers between the company's computer systems and terminals."

The SL-1/ADM system fits in well with First Bank's data processing applications. "Our holding company — First Bank Systems — does planning for all the affiliate banks in the company around the upper-Midwest five-state area," according to John Dewitt, a financial systems analyst at the bank. "The program development people are responsible for a variety of functions including profit center accounting. The financial planning group provides financial information and analytical help to other departments."

According to Anne Burkholder, a financial planning, officer the current SL-1/ADM system configuration is just the beginning of what will be done. "This year we will have microcomputers in some of the functional areas of the bank," she predicted.

"In fact, the trust department already has a microcomputer connected to the financial planning system via an ADM. These departments use a financial modeling program to take our basic planning numbers and adapt them to their particular needs," she said.

The ADM arrangement also adds reliability and faster response times to operations. If all terminals are hardwired to a computer and that computer goes off-line (for example, in the case of maintenance or program changes), those terminals remain out of service until the computer is again functional. On the other hand, terminal/ADM users can simply dial up another appropriate computer on or off premise.

YOU WON'T FULLY APPRECIATE US UNTIL 11689.

That's January 1, 2000 AD to a Microdata computer. The way we store the date internally (incrementally from January 1, 1968) is just one of the reasons Microdata's relational data base system will still make smart business sense in the next century.

Just think. If your computer stores the date as DD MM/YY, and your programs sort on date, you'll be doing a lot of recoding while everyone else is celebrating the turn of the century.

Here's another one. The ZIP code. When it expands from five to nine digits, a lot of programming departments will be facing a lot of overtime. But thanks to variable length records, Microdata users will just key in a new field definition.

Flexibility is just one reason the world is turning to Microdata.

Outstanding productivity tools are another.

Microdata systems were user-friendly long before that word became a cliche. Our ENGLISH retrieval language was the first to make computer access quick and comfortable for users with no special training. And ALL, our revolutionary application generator, can literally cut application development time from months to days. Not to mention relieving programmers of the tedium of maintenance and documentation.

But the Microdata concept goes beyond computer technology. It's a way of doing business. So while the hardware of the next century will hold surprises, you'll still feel right at home.

Don't wait until 11689 to appreciate Microdata. Write Microdata Corporation, P.O. Box 19501, Dept. T-208, Irvine, CA 92713.

Microdata

SIMPLY POWERFUL

Microdata is a subsidiary of McDonnell Douglas Corporation.
©1983

'Nobody Knows the Data I've Seen . . .'

Kaypro Unveils Portable Micro With Networking

DEL MAR, Calif. — A portable computer with built-in networking capabilities has been announced by Kaypro Corp. here and Centram Systems, Inc., Camp Hill, Pa., developers of the Web networking system.

The Kaypro computer includes a 125K bit/sec Web transceiver and network interface. The networking software — OPSnet from Aquinas, Inc. — supports most Digital Research, Inc. CP/M 2.2 programs without modification, while supporting full network operations, a Kaypro spokesman said.

The cost of the networking option on the Kaypro will be $195. Systems may be configured using any combination of Kaypro II, Kaypro 4 or Kaypro 10, a 10M-byte hard disk machine that retails for $2,795.

Kaypro's address is P.O. Box N, Del Mar, Calif. 92014.

Cluster Device Supports Ascii to Non-IBM

SAN DIEGO, Calif. — Term-Tronics, Inc. has introduced its 3270-4 Interactive Cluster Control system, said to enhance support for Ascii communications to non-IBM-3270-oriented computers, minicomputers and microcomputers when used with the Term-Tronics 3270 X A/B display station.

The Model 3270-4 controller reportedly has the operating characteristics and capabilities of a 12-port IBM 3274-51C controller and reportedly supports IBM's Binary Synchronous Communications line protocols at speeds up to 9,600 bit/sec over dedicated lines.

The 3270-4 is designed to operate with the Term-Tronics 3278 or 3279 color display stations, according to a vendor spokesman.

Priced at $2,995, the controller is available from Term-Tronics at 7408 Trade St., San Diego, Calif. 92121.

GTE Telenet Uses Protocol

VIENNA, Va. — GTE Telenet Communications Corp.'s Telenet Public Data Network will now support direct transmissions between personal computers and host computers or other systems utilizing a communications protocol developed by Microcom, Inc. of Norwood, Mass.

The Microcom Networking Protocol is said to provide error-free data communications over a local dial-up telephone circuit linking a personal computer with the Telenet network.

Charges for usage of the Telenet network are in the range of $6/hour to $8/hour, compared with $25/hour to $30/hour for long-distance telephone service, which does not provide error detection/correction or protocol conversion, a GTE spokesman said. More information is available from GTE Telenet, located at 8229 Boone Blvd., Vienna, Va. 22180.

Translator Ties CPU to Ascii Units

YOUNGSTOWN, Ohio — A protocol translator said to give central computers the capability of communicating with all Ascii terminals without having to learn their languages has been introduced by Western Datacom Co.

The Datacom 1000 asynchronous protocol translator requires no additional peripheral equipment, and a full range of programming functions is internally converted to the nomenclature of the various computer manufacturers.

Attached to modem lines, the translator will request terminal type once the carrier is detected; when attached to dedicated lines, data lines are monitored for a specific control sequence to change terminal type.

The company has also introduced the Lineguard 3000 two-channel asynchronous dial-up security system. Within a 60-second sequence, the security device will request the caller's assigned code number, verify the number and ask the caller to hang up and await a call back that will then connect to the computer.

The Datacom 1000 is priced at $875, and the Lineguard 3000 at $945. More information is available from Western Datacom at 5083 Market St., Youngstown, Ohio 44512.

Modem Sharer Handles Four Units

CHAMPAIGN, Ill. — A modem-sharing unit said to allow up to four data communications terminals to share one modem has been announced by Compre Comm, Inc.

The MM-4 Modem Multiplier has a concatenation feature said to allow an increase in the number of terminals on one line through the connection of an additional MM-4 to one of the terminal ports of the other MM-4.

Each port has Request-to-Send and Clear-to-Send indicators to aid in network fault isolation, the vendor said.

The MM-4 costs $475 from Compre Comm through 3200 N. Farber Drive, P.O. Box 3570, Champaign, Ill. 61821.

Check to see how SEED® sets the standard for DBMS comparison.

Compare any DBMS with SEED for...

	SEED DBMS	Other DBMS	Other DBMS
Transportability SEED lets you standardize development within your organization by running on a wider range of hardware than any other DBMS—DEC, IBM, Prime, Perkin-Elmer and CDC. You can transport applications across machines, and develop applications on a micro to operate them on a mainframe—or the reverse.	✓		
Flexibility SEED's flexibility answers your demands for reduced programming, faster development and more efficient operation. SEED supports a variety of data base architectures.	✓		
"Smart" Decision Support Tools SEED's non-procedural decision support tools—HARVEST® query language, BLOOM® report writer, and RAINBOW graphics get information out of a complex data base without the need for programming.	✓		
Application Development Tools SEED KERNEL® employs a dictionary to permit centralized definition of your data base contents. KERNEL lets you build custom applications with COBOL, FORTRAN, or VISTA, the SEED screen formater. KERNEL utilities help you in tuning your application, speeding its development, ensuring its data reliability, loading the data base from files, and testing your data access algorithms.	✓		
Journaling and Security Facilities SEED's journaling capability keeps your data base uncorrupted. SEED also adds its own security features to those of your host computer to protect your information from unauthorized access.	✓		
Service We put experienced professionals at your disposal. Through a telephone hotline, you have access to an extensive consulting team, personalized on-going support and maintenance.	✓		

Get Complete Details on SEED now. Find out more about how SEED DBMS increases productivity for managers, programmers, and end-users, and how SEED makes DBMS maintenance and operation more economical. Send for the SEED DBMS Information Kit now. It's free. Or call us at (215) 568-2424. Also ask for information on our free DBMS Seminars.

☐ Send me the Information Kit. C81583
☐ Call to discuss my specific requirements.
☐ Send me details on DBMS Seminars.

Name Title
Company
Address
City State Zip
Telephone
☐ OEM ☐ System Integrator ☐ End User
Computer
Operating System

UNITED TELECOM COMPUTER GROUP

SEED SOFTWARE
2300 Walnut Street
Suite 734
Philadelphia, Pa.
19103
(215) 568-2424

RTA-327II Measures Net Performance Level

EAST NORWALK, Conn. — A data collection instrument for measuring performance level and network efficiency of data communications networks has been announced by Datacomm Management Sciences, Inc.

The RTA-327II Response Time Analyzer is designed specifically for use with IBM's Binary Synchronous Communications and Systems Network Architecture/Synchronous Data Link Control protocols with IBM 3271, 3274, 3276 or equivalent terminals operating in the conversational mode, according to a spokesman for the vendor.

The device reportedly permits simultaneous measurements of user-perceived response time, host and polling delays, traffic loading and other parameters that impact overall system performance.

This data, according to the spokesman for the vendor, enables network managers to see and experience system responses and delays as a user would.

List price of the RTA-327II Response Time Analyzer is $4,875, the vendor said. Additional information can be obtained from Datacomm Management Sciences, located at 25 Van Zant St., East Norwalk, Conn. 06855.

ID Systems Graphics Terminal Out

HILLIARD, Ohio — A high-resolution graphics terminal said to offer dual-display architecture, National Television Standards Board compatibility and such features as zoom and pan has been announced by ID Systems Corp.

The ID-200 offers 1,280-by 480-pixel resolution with a display writing rate of up to 1.25M pixel/sec. The unit features 128 downloadable fonts said to enable users to create their own characters, in different languages if desired. Up to eight windows may be displayed simultaneously.

Said to feature "virtually infinite" color graphics patterns, the ID-200 has graphics command compatibility with most Tektronix, Inc. terminals, including Models 4010, 4014 and 4027. It has full Digital Equipment Corp. VT100 features and multipage editing compatible with DEC's VT132.

The ID-200 costs $4,000 from ID Systems, located at 4089 Leap Road, Hilliard, Ohio 43026.

FTC Announces Reductions For Leased-Channel Users

NEW YORK — A reduction in monthly rates for leased-channel users of its international communications services has been announced by FTC Communications, Inc. (FTC), effective immediately.

Private systems users of 50 bit/sec and 75 bit/sec telex services will experience a 55% rate reduction, the company said.

Rates of $1,000/mo, down from $1,600, are now in effect for Argentina, Austria, Belgium, Bermuda, Cameroon, Denmark, France, Germany, Ireland, Italy, Ivory Coast, Niger, Netherlands, Norway, Portugal, Saudi Arabia, Senegal, Sweden, Switzerland and the UK.

Rates of $1,000/mo, down from $2,200, are now in effect for Australia, Hong Kong, the Philippines and Singapore.

Further information is available from FTC at 90 John St., New York, N.Y. 10038.

MicroAge®

"THE RIGHT COMPUTER STORE FRANCHISE FOR ME!"

"They wanted us to succeed and they acted like it!"

"At our West Palm Beach, Florida, MicroAge Computer Store, we sell primarily to business people, professionals and corporate accounts. Being part of the MicroAge Computer Store network gave us the knowledge, support and name recognition we found to be essential to our success. Plus, during our first year and a half, MicroAge developed a relationship with us that helped us bypass potential mistakes and grow."

"Since joining MicroAge, our store size has doubled and our staff has quadrupled. Today our store has expanded from 1,800 square feet to 3,700 square feet, while our staff grew from 3 people to 13 people. Our growth with MicroAge has been beyond my expectations."

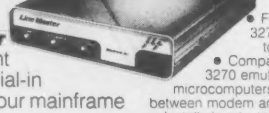
"Am I satisfied with my MicroAge franchise. . . absolutely!"

Lenny Warshaw
President

To build your own professional computer sales organization with MicroAge write to:

MicroAge COMPUTER STORES
1457 West Alameda • Tempe, Arizona 85282
(602) 968-3168

introducing
Dial-Up 3270



LineMaster
An intelligent device for dial-in access to your mainframe 3270 line.
LineMaster is a communications watchdog which keeps a line in service until a user dials in.

• For any remote 3271/4/6 line, up to 19.2K baud.
• Compatible with any 3270 emulator including microcomputers. • Connects between modem and mainframe.
• Installs in minutes.

$639.

MicroFrame, Inc.
205 Livingston Avenue
New Brunswick, NJ 08901
(201) 828-4499

COMING SOON TO A SYSTEM NEAR YOU!

9800C

The Intelligent Answer To Hostile Communication Circuits.

comspec, inc.
10000 Old Katy Rd. #275
Houston, Texas 77055
(713) 461-4487
Telex: 910-881-4763

Supports Up to 128 Users

Pyramid 32-Bit Mini Designed for Unix

MOUNTAIN VIEW, Calif. — A start-up minicomputer maker here has unwrapped a 32-bit, virtual memory minicomputer designed for the Unix operating system, including the Unix System V.

Pyramid Technology Corp.'s Pyramid 90x features the vendor's Xtend bus, a proprietary CPU featuring a 4K-byte high-speed instruction cache, an enhanced Unix operating system, a sophisticated memory hierarchy, intelligent I/O processors and the ability to support up to 128 users.

The system's proprietary three-board CPU executes instructions in two machine cycles and can be pipelined for further performance, the vendor said.

The synchronous Xtend bus has an open-end design that will allow future multiprocessor configurations and the integration of new technology. The bus reportedly has a 32M byte/sec bandwidth and accommodates the CPU; one to four memory modules holding 1M- to 2M bytes each; the System Support Processor (SSP); and multiple I/O processors, which allow for interfacing to peripherals, networks and adapters to other buses, including Intel Corp.'s Multibus.

Pyramid's ported version of System V (under license from Western Electric) incorporates enhancements made by the University of California at Berkeley and proprietary Pyramid 90x enhancements that automatically handle programs and data arrays that are larger than physical memory, the vendor said.

The 90x's physical memory space can range from 1M- to 8M bytes, and the memory hierarchy provides each Unix process with 4G bytes of virtual address space utilizing a 2K-byte page size for demand paging.

The SSP, including Motorola, Inc.'s 68000-based auxiliary computer, reportedly performs local and remote diagnostic and test functions for the system. The SSP is the operator console interface and can be used to monitor system operations, configure software, control I/O processors and report system errors.

All packaged systems include the Pyramid 90x computer with CPU, main memory, Xtend bus, disk subsystem, magnetic tape subsystem and line printer controller; the SSP with a local or remote terminal and floppy disk drive; one or more intelligent terminal processors, each providing 16 asynchronous RS-232C ports for user terminals or networking communications; Unix operating system, including utilities and C language with globally optimized code generator; and basic documentation.

Pyramid 90x ranges in price from $99,000 to about $300,000, depending upon system configuration. Pyramid Technology is located at 1295 Charleston Road, Mountain View, Calif. 94043.

Wanted: Mini Stories

Minicomputers and their makers are in for some stormy weather.

As microcomputer and small business system manufacturers rival the performance of the mini makers, users are holding off on their purchase decisions. Current mini users are turning their collars up to their machines in favor of the micro cyclone.

What can minicomputer firms do to keep current users and attract new ones? More importantly, how do users decide what type of machine is best for them?

In September, *Computerworld* will publish a Special Report. If you are a vendor or user that has a decided point of view about the advantages offered either by a mini or small business system, we would like to hear from you.

Contributors are requested to send typewritten articles, approximately five to eight double-spaced pages in length. Charts and other graphics are welcome. Contributions should be sent no later than Aug. 26 to Senior Editor Ed Scannell, *Computerworld*, 375 Cochitutate Road, Box 880, Framingham, Mass. 01701.

STC Expands 4305 Storage Capacity

LOUISVILLE, Colo. — Storage Technology Corp. has expanded the storage capacity of both models of its 4305 Optimizer Storage Subsystem used in high-performance I/O operations.

The features, which include IBM 3380 disk drive emulation on the 4305 Model 6, can be installed on existing 4305 devices at customer sites. Previously, the 4305 could emulate only IBM's 2305 fixed head drum units.

The enhanced 4305 Model 6, with the 3380 emulation feature, will offer up to 192M bytes of semiconductor storage. The subsystem can be configured with one or two controllers and up to eight storage modules.

The Model 6 costs from $105,290 for a single controller and single storage module unit with 12M bytes of memory to $763,475 for a two-controller configuration with eight storage modules and 192M bytes of memory, the vendor said.

The enhanced Model 3 is available now and provides users with up to 48M bytes of semiconductor storage with a single controller.

The Model 3 costs from $76,730 for a single controller and single storage module with 12M bytes of memory to $229,620 for the single controller and four storage modules with 48M bytes of memory, the vendor said from 2270 S. 88th St., Louisville, Colo. 80028.

Pharmaceutical Testing Firm Cuts Costs With Supermini

BERLIN — A subsidiary built around a superminicomputer has helped a pharmaceutical testing company here to speed processing and cut the costs of computer analysis.

Arzneimittelforschung Berlin (AFB) collects clinical data on new drugs for pharmaceutical companies that have already completed the initial laboratory testing of new drugs themselves. AFB provides the last reaction testing before a new drug is licensed. Testing falls primarily into two areas: electrophysiological, with data collected from electroencephalographs (EEG) showing results on the central nervous system, and behavioral, using psychoexperimental models, performance tests and standardized rating scales.

AFB is currently composed of three companies: International Drug Experts Associates (Idea), Gesellschaft fur Arzneimittelprufung (GFA) and Comstat (Computation and Statistics).

In 1981, company officials realized that reliance on outside services for its computer analysis was expensive, time-consuming and not suited to AFB's requirements. Recognizing the need for in-house data processing and analysis facilities, three enterprising employees formed a new company under the AFB umbrella that year. Comstat was created around a Harris Corp. Harris 80 superminicomputer system, and its basic tasks included the development of application software, input data programs, the establishment of algorithms and models and the development of other tailor-made software programs.

Comstat's Harris 80 has 768K bytes of real memory, 6M bytes of virtual memory, two 80M-byte Winchester disk drives, two magnetic tape drives, six interactive terminals with special keyboards for APL and an electrostatic printer/plotter. Future system plans include connecting graphics terminals

(Continued on Page 76)

Turnkey Aims At CAD/CAM, Said to Cost Less to Own

By Jeffry Beeler
CW West Coast Bureau

PALO ALTO, Calif. — A two-year-old supplier of computer-aided design and manufacturing (CAD/CAM) aids has added hardware to its existing application software to produce a turnkey system that reportedly costs three times less to own than competing products.

Aimed exclusively at the mechanical CAD/CAM sector, Cadlinc, Inc.'s Computer-Integrated Manufacturing (CIM) Network marks the company's debut as a hardware and systems vendor. Prior to CIM Net's debut, the company's only products were a series of CAD/CAM application packages.

At the system's heart is a personal engineering workstation built around a 16/32-bit Motorola, Inc. 68000 microprocessor, according to a company official. Up to 1,000 of the workstations can be tied together through Xerox Corp. Ethernet networking protocols that allow users in one design or manufacturing area to share data and exchange files with colleagues in other areas.

Each CIM Net console costs roughly $8 per hour to operate. With competing CAD/CAM systems, by con-

(Continued on Page 76)

Personal CAD System Combines Turnkeys

IRVINE, Calif. — Manufacturing and Consulting Services, Inc. (MCS) has introduced a full-featured personal computer-aided design (CAD) system said to be a turnkey combination of its Anvil-3000D advanced interactive drafting system, Data General Corp.'s Desktop Generation 16-bit computer line and Tektronix, Inc.'s 4107 color terminal.

Jointly announced with the Desktop Generation line, the single-user system reportedly combines the Anvil-3000D CAD software package and Workplane Tablet with several overlays, the DG desktop engineering computer system with a 15M-byte hard disk drive and a floppy disk drive, the Tektronix 4107 color terminal, including 640 by 480 displayable matrix and tilt/swivel adjustable stand, with a Tektronix color ink-jet printer/plotter as standard equipment.

System options include a solid oak desk with the system for $1,500, a Tektronix 4114 or 4115 high-resolution display and a high-performance Hewlett-Packard Co. D- or E-size plotter.

The turnkey CAD system is priced at $38,500 in single-quantity purchases. MCS is located at 17942 Cowan, Irvine, Calif. 92714.

Solid-State Disk Emulator Boasts Drive Replacement

EL SEGUNDO, Calif. — Imperial Technology, Inc. has announced a solid-state nonrotating disk emulator system called the Megaram-7000, said to be a direct replacement for Digital Development Corp., Data Flux and Vermont Research rotating fixed-head disk drives.

The Megaram-7000 reportedly accommodates a variety of different drive formats and capacities and is both hardware- and software-equivalent to the drives it replaces, according to a spokesman for Imperial Technology.

The system features 10M bytes in a 7-in. chassis expandable to 16M bytes, battery backup option, full error detection and correction, high reliability and ease of maintenance, the spokesman said.

The storage system is contained in three subassemblies. The 2M-byte version of Megaram-7000 costs $16,600, according to the vendor spokesman.

Additional information on Megaram-7000 is available from Imperial Technology, which is located at 831 S. Douglas St., El Segundo, Calif. 90245.

3M Trendcom Unwraps Line Of Printers

SUNNYVALE, Calif. — A line of portable thermal printers has been unwrapped by 3M Trendcom, Inc.

The Models 150 and 151 employ a 4½-in. carriage for 40-col printing and 80-col compressed printing. Models 250 and 251 have an 8½-in. carriage said to accommodate 80-col applications and 136-col compressed printing.

All four models are equipped with a standard 2,048-char. buffer, and microprocessor control enables bidirectional look-ahead printing, a vendor spokesman said.

Model 150 with RS-232 serial interface costs $259; Model 151 with parallel interface costs $249; Model 250 with RS-232 serial interface costs $299; and Model 251 with parallel interface costs $289.

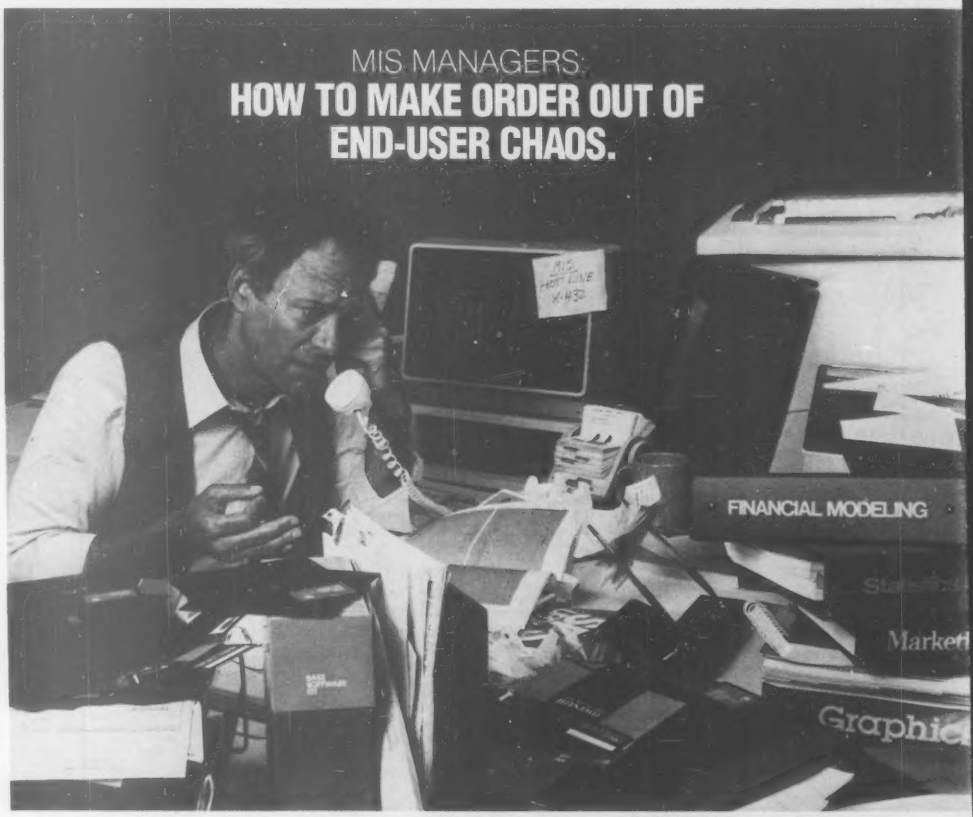
More information is available from 3M Trendcom, located at 480 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Companion Drives Out for Micromate

MOUNTAIN VIEW, Calif. — Personal Microcomputers, Inc. has announced two companion disk drives for its Micromate microcomputer.

A double-sided, double-density, dual disk drive offering 400K bytes of storage per disk costs $895, according to a spokesman for the vendor. A 10M-byte, half-height Winchester hard disk drive costs $1,995.

Personal Microcomputers is located at 475 Ellis St., Mountain View, Calif. 94043.



Trying to coordinate and maintain control over all the different pieces of the end-user puzzle? Struggling to manage and integrate all those personal computers, with their proliferating data bases that don't talk to each other? Scrambling to provide a smoothly operating Information Center that painlessly integrates all the graphics, data management, and analysis capabilities your users are asking for?

EXPRESS Ties It All Together. Integrated, corporate-wide user support is available *now* with EXPRESS, the Decision Support System software from Management Decision Systems.

EXPRESS Integrates the Functions Your Users Need. EXPRESS has all of the necessary components: Data selection and query. Graphics and display. Statistics and analysis. Modeling and simulation. All built around a special data manager designed specifically to handle end-user data and applications.

EXPRESS has more than enough functionality to satisfy even the most sophisticated management needs: Marketing. Finance. Operations. Strategic planning. Economic analysis. From any level of the organization right up to the CEO.

EXPRESS Integrates All Your Data. EXPRESS collects data from any source, resolving format discrepancies and checking for data validity.

It gives managers the ability to combine data from the corporate DBMS with external data. From various sources of financial, econometric, government, trade association, demographic, and syndicated corporate information. And EXPRESS presents all this data in an intelligible, usable form.

EXPRESS Integrates Departments. EXPRESS not only gives corporate departments access to each other's data, but to each other's analyses and conclusions as well.

While developing next year's financial plan, finance can call up marketing's sales projections. Operations has access to the strategic planner's estimates of future space and personnel needs. And top management can use the analyses and projections of every department to help meet corporate objectives.

EXPRESS combines this data sharing with complete data security, controlled by individual users or by your data administrator.

EXPRESS Integrates Personal Computers Into the Corporate DSS System. With EXPRESS, your users' personal computers become part of the corporate decision support system.

With EXPRESS's micro features,

Express/DSS

Daisywheel Printer Outputs Machine-Readable Copy

SAN DIEGO — The Troy Division of Data Card Corp. has announced a medium-speed daisywheel character printer for local and remote-site generation of machine-readable financial documents.

Called the Remote Office Imprinter (ROI), the unit is equipped with magnetic ink character recognition capabilities. The unit also produces optical character recognition and alphanumeric characters, the vendor said.

The ROI can handle distributed printing of such documents as insurance claims, explanations of benefits, payrolls, dividends, refunds, preauthorization and exception checks, questionnaires, bond dividends and tax statements, the vendor said.

The ROI costs $12,000, Data Card said from 2331 S. Pullman St., Santa Ana, Calif. 92705.

Printers, Modems Debut

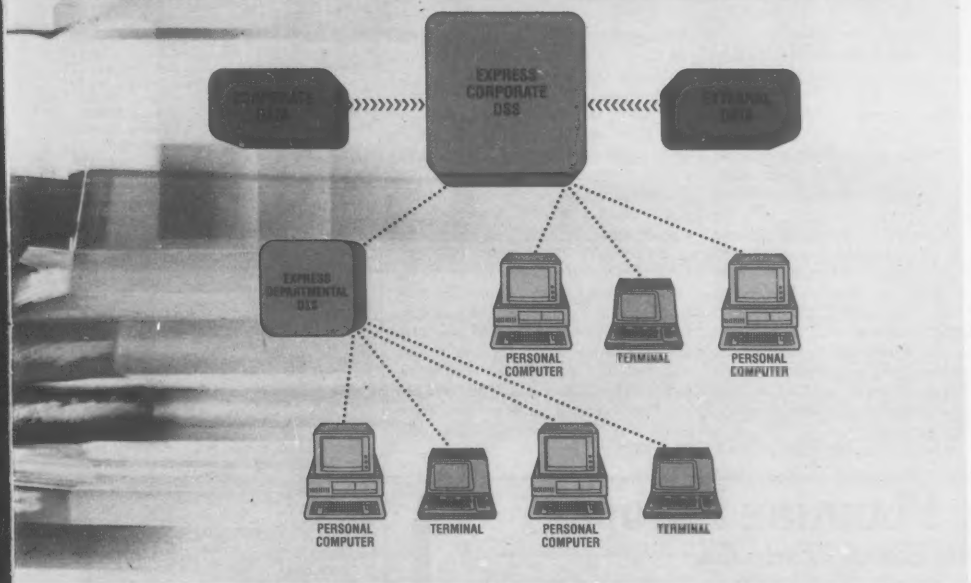
SCOTTS VALLEY, Calif. — Victor Technologies, Inc. has added two printers and three modems to its line of office automation products.

Added to Victor's line of dot matrix printers are the Models 6015 and 6025. The Victor 6015 uses cut sheet roll paper or fanfold paper up to 10 inches wide. The Victor 6025 can use the same paper up to 16 inches wide. Both printers can produce an original and up to two copies at a rate of 160 char./sec. The units feature a full 9-char. Ascii set with descenders plus numerous international character sets. The printers cost $925 and $1,160, respectively, the vendor said.

Also announced was a line of modems. The Victor 6260, 6261 and 6262 are fully Bell-compatible and registered with the Federal Communications Commission. The 6261 has a 1,200 bit/sec capacity. The 6262 supports transmission speeds from 0- to 300- and 1,200 bit/sec, the vendor said. Each of the modems operate on an RS-232C interface, and they cost $245, $495 and $695, respectively, the vendor said.

Victor is located at 380 El Pueblo Road, Scotts Valley, Calif. 95066.

EXPRESS – THE DSS INTEGRATOR.



users can download data to their P.C.'s from the EXPRESS corporate data base – budgets, income statements, syndicated marketing data, any external data on file. Use micro packages such as Visicalc® and Lotus's 1-2-3® to manipulate the data. Send back the results to the corporate data base to be shared by other users. Use EXPRESS's advanced capabilities to do further analysis or modeling.

Your users can do all this, while EXPRESS coordinates, manages, and ties together all that data for you.

EXPRESS's Integration Makes You a Hero. By integrating across functions, departments, data sources, and P.C.'s, EXPRESS gives you the power to quickly meet your users' needs while always maintaining control. As a result, you'll ease the load on your staff. Clear out that applications backlog that's been piling up. Ensure data validity, smooth data sharing, and security among all your users, whether they're using your Information Center, their own P.C.'s, or a combination of both. And your staff will use EXPRESS's powerful, 4th-generation programming language to deliver complex systems in days, not months.

EXPRESS Has a Proven Track Record. We've been in the DSS business for 12 years and have success stories in hundreds of top companies world wide. Companies in a variety of businesses – heavy manufacturing, consumer packaged goods, insurance – including Avon, Firestone, G.D. Searle and Bell (Canada).

And we offer our clients a lot more than just software. We have comprehensive training programs and user documentation to get you up to speed quickly. On-going technical support to answer any questions. And the best, most experienced DSS application and implementation experts in the business.

Find Out What EXPRESS Can Do For You. We think EXPRESS may just turn out to be one of the best business decisions you've ever made. And we'd like an opportunity to prove it.

Give us a call today and we'll tell you more about this remarkable DSS package and how it can clear up your integration headaches. We can arrange a hands-on demonstration and show you how we've worked with companies like yours.

Call us at our corporate office at (617) 890-1100. Or write EXPRESS Product Manager, Management Decision Systems, Inc., 200 Fifth Avenue, Waltham, Massachusetts 02254.

Management Decision Systems, Inc.

HP Unwraps Six-Pen Plotter, Cuts Other's Prices

PALO ALTO, Calif. — Hewlett-Packard Co. has announced the HP 7475A, a six-pen graphics plotter. At the same time, the firm lowered prices on the two-pen GP 7470A by 30%. Both plotters can be used with microcomputers made by IBM, Apple Computer, Inc. and Digital Equipment Corp.

The HP 7475A accepts both 11- by 17-in. and 8½- by 11-in. paper plus overhead transparency film. With its six-pen carousel, the plotter produces multicolor pie, bar, line and text charts with a line resolution as fine as 0.001 in., the vendor said.

Plot speed on the 7475A is 15 in./sec with a 2g acceleration. The unit costs $1,895, the vendor said.

The price on the two-pen 7470A is $1,095. More information is available from the Inquiries Manager, HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

DEC Book Series Covers Micros For Users

BEDFORD, Mass. — Digital Press, Digital Equipment Corp.'s in-house publishing group, has released a series of books called "Desktop Computer Series," which centers on the issues of personal computers in business.

Approximately 20 titles will be included in the series over the next two years, the vendor said. The initial book, "Your First Business Computer," will be followed by titles that will focus on personal computers in a corporate environment, management applications of personal computers and specific professional applications such as law, medicine and engineering.

Books in the series differ from other Digital Press publications because they address the needs of computer users, not professionals; are planned as a series; and are available through book trade channels as well as direct mail, the vendor spokesman said.

"Your First Business Computer" costs $15, from Digital Press, 12 Crosby Drive, Bedford, Mass. 01730.

Supermini Boosts Drug Tester's Efficiency

(Continued from Page 73)

to enable Comstat to produce three-dimensional pictures of the spectrum of data. Also, a special interface to a real-time processing peripheral device provides a direct link from the EEG to the Harris 80, allowing direct entry and direct feedback. This interactive feature, which saves AFB both time and money, would be impossible if the computing was done by an outside company, according to Harris Corp.

"Computers like our Harris 80 are a prerequisite when you consider the enormous amounts of data we gather," Dr. Werner M. Herrmann, an AFB official, said, adding "We must have easy data handling and a relatively large core memory to be able to process [our] tremendous amounts of data."

The superminicomputer enables AFB to do a complete analysis with all the multivariate statistics that are in use, including methodologies such as factor, cluster or discriminate analysis.

Comstat develops all its own software, since currently there are no packages on the market that conform to its needs, particularly in the graphics area. "Every problem we face is a new one," stated Comstat cofounder Joachim Willmann. Approximately two-thirds of Comstat's work is done in APL. The remainder utilizes Fortran. Comstat's end product is a statistical study of the trial. It may include EEG profiles, dose- and time-effect curves, graphs and tables after data reduction, according to the requirements of the trial and the request of the customer.

"All in all, we think the Harris computer offers us the best price/performance ratio, especially in APL. We also recognize the growth possibilities available to us with the Harris 80," Willman concluded.

Voice Board Announced For Apple

SAN FRANCISCO — Voice Recognition Systems is offering an Apple Computer, Inc.-compatible voice recognition board said to allow users to input commands and repetitive data by speaking into a microphone.

Providing voice recognition signal processing algorithms, the Apple Voice Input Module (Avim) receives the user's verbal commands, recognizes them and then responds with any sequence of keystrokes users require. Its resident memory of 8K bytes can store up to 80 voice-command/keyboard-response sets at one time; other commands can be stored on disk and accessed in seconds, a spokesman noted.

A comprehensive menu-driven utility program reportedly allows users to create command sets and train them to recognize the user's voice. Avim will input any Apple-compatible program with no software modifications and operates as a keyboard emulator rather than a peripheral device operating through an RS-232 port.

Complete turnkey systems, including the Apple IIe computer, are available. The add-on system for the Apple II+, IIe and Apple-compatible systems is priced at $995. An adapter for the Apple IIe is an additional $75. Voice Recognition Systems is located at 550 Battery St., San Francisco, Calif. 94111.

CIM Network Designed For Mechanical CAD/CAM

(Continued from Page 73)

trast, the console-per-hour ownership cost averages $23 to $25, the official said.

Cadlinc partly attributes the threefold cut in ownership expense to the 68000's superior price/performance and to steadily decreasing memory costs in the semiconductor industry.

In an effort to make the system easy to use, Cadlinc has equipped CIM Net with user-interface features reminiscent of Apple Computer, Inc.'s Lisa. The CAD/CAM product, for example, comes with predefined menus, the ability to display multiple screens simultaneously, a cursor-positioning mouse and Lisa-like icons that pictorially represent familiar user functions.

In addition to the 68000-based workstations, CIM Net boasts a series of CAD/CAM-oriented application packages that support tasks like multidimensional design, surface modeling and two-dimensional detailing and drafting. The system also comes with a networking application package that reportedly provides a communications interface to installed CAD/CAM products from competing vendors.

To ensure that users of other CAD/CAM offerings can transport their existing software to CIM Net, Cadlinc has built its product around the Unix operating system, the official explained.

In a fully networked configuration, CIM Net costs $35,000 per workstation and is available from Cadlinc at 1872 Brummel, Elk Grove, Ill. 60007.

A seminar on IDMS/R.

Seminars on Cullinet's relational database management system, IDMS/R, will be held in the following cities during the next few weeks.

Atlanta, GA	September 14
Augusta, GA	September 1
Austin, TX	September 15
Boston, MA	September 20
Calgary, ALTA	September 15
Charlotte, NC	September 22
Chicago, IL	September 7
Cincinnati, OH	September 12
Cleveland, OH	September 19
Columbus, OH	September 9
Dallas, TX	September 7
Des Moines, IA	September 28
Eau Claire, WI	September 21
Evansville, IN	September 27
Grand Rapids, MI	September 15
Hartford, CT	September 14
Houston, TX	September 29
Indianapolis, IN	September 20
Jacksonville, FL	September 29
Kansas City, MO	September 22
Lexington, MA	September 7
Los Angeles, CA	September 21
Louisville, KY	September 7
Memphis, TN	September 20
Miami, FL	September 29
Milwaukee, WI	September 13
Minneapolis, MN	September 8
Montreal, QUE. (Eng.)	September 14
Montreal, QUE. (Fr.)	September 15
Nashville, TN	September 13
New Orleans, LA	September 29
New York, NY	September 21
New York/Long Island, NY	September 13
New York/Rye, NY	September 7
Norfolk, VA	September 28
Omaha, NE	September 29
Ottawa, ONT	September 13
Parsippany, NJ	September 23
Philadelphia, PA	September 28
Sacramento, CA	September 27
St. Louis, MO	September 6
Salt Lake City, UT	September 27
San Diego, CA	September 13
San Francisco, CA	September 15
Savannah, GA	September 29
Seattle, WA	September 29
Southfield, MI	September 15
Toledo, OH	September 27
Toronto, ONT	September 20
Tucson, AZ	September 28
Washington, DC	September 7
Wichita, KS	September 20
Winnipeg, MAN.	September 28
Worcester, MA	September 22

I'm interested in reserving a place at the IDMS/R seminar
in (city) _____ on (date) _____
Name _____
Title _____
Company _____
Address _____
Operating Environment _____

Cullinet Software works with all IBM 360, 370, 30XX and 43XX computers – or plug compatible equivalent.
Cullinet Software, Inc., Corporate Meetings Department
400 Blue Hill Drive, Westwood, MA 02090 8/83 CW

Successor Planning Europe

Executive Search & Selection

Your decision on who will supervise your investment in Europe is essential to successfully marketing products and services here. The feedback you receive from your managers working at European and local country level determines the quality and success of many of your strategies. At the same time, the input your European employees receive from their local managers will determine their level of involvement in the future of your company.

It is impossible to over-emphasize the importance of finding the right person for a given position. Identifying management talent in Europe's high technology industries has been our business for over 14 years. We will study your management needs and help you to find, select, and integrate the right people to run your European operation.

Since 1969 we have assisted both American and European companies to staff almost 1,000 key management functions with experienced, result-oriented executives. Below are several examples:

Positions filled
Regional and international Vice President · General Manager · Controller · Treasurer · Marketing/Sales/Product Managers · F & A Manager · Software Manager · Systems Software Support · Customer Engineering · Branch Office Manager · Advertising · Personnel · General Council · Auditors · Public Relations · Sales and Management Training

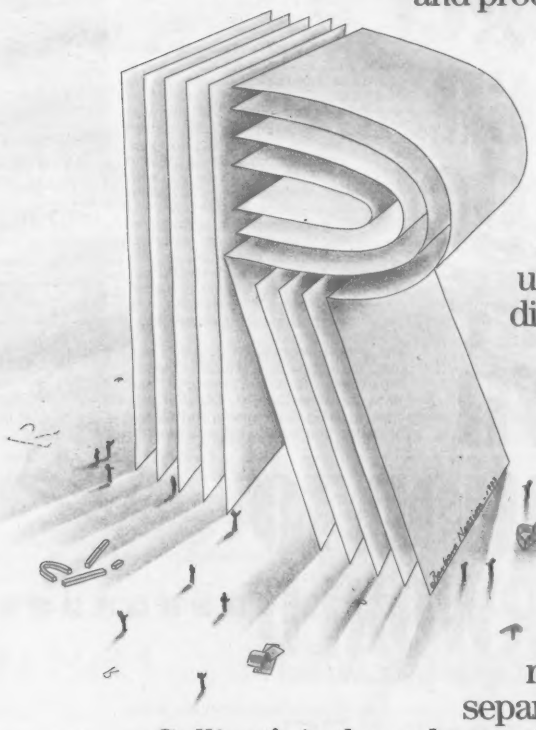
High-tech branches served
VLSI-Mainframers · Plug Compatible · MINIS · MICROS · Small Business Systems · Printer/Word Processor Manufacturers · Data Comm. · Packaged Software · Systems House · EDP and Management Consultants · CPA Firms · Time Sharing · Computer Services · Data Center · All forms of EDP-Users

If successor planning or staffing your European organisation requires professional attention please contact us **for the lion's share of your executive search.** Video interviews of candidates screened to your specifications as well as guarantees for the success of both – the search and the selection process – are a few of the many advantages you have with **DOLAN CONSULTING.** Please call or telex for an appointment with a consultant in your offices or see us when you are next in Europe.

DOLAN CONSULTING
... for the lion's share of executive search!
34, Untermainkai, D-6000 Frankfort-on-Main 1, Tel.: 23 08 76, Telex 04 13 418 kcbs d
Germany · Austria · Benelux · Switzerland

The one and only R.
Cullinet's production/end user relational DBMS.

IDMS/R is a single solution to the two-sided problem of providing useful database applications for both end user and production tasks.



This is how it works:

As a true relational system, it allows you to select data from separate and unrelated files; join it, then project it in ways that make it possible for you to handle small-scale applications and unstructured end user requests for information quickly, directly and intelligently.

What's unique is that IDMS/R also allows you to handle high-volume production applications with the proven technology best suited for the job.

It's this marriage of architectures that makes Cullinet's relational DBMS stand apart. In fact, where others have tried to propose relational or pseudo-relational components that exist separately from the production database, Cullinet's is the only one that lets both work together. Thus serving the whole corporation by serving all of the needs within it.

The answer is software.
And software is Cullinet.

For information and a seminar schedule call 617-329-7700. © 1983 Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090.

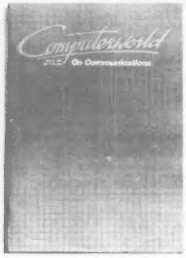
Look at all the extras you get when you get your own subscription to COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

When you get your own subscription to *Computerworld* you get ALL the news delivered fresh to your desk every week – more news than you get from any other computer publication.

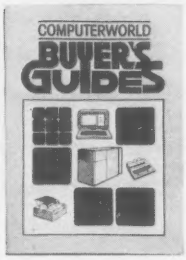
But that's not all. You also get a series of special *Computerworld* publications designed especially to serve your growing need for specialized information. Publications like:

Every two months, *Computerworld OA* gives you a detailed, thoughtful look at all the happenings in Office Automation. Each issue examines a particular area of OA, giving you a complete overview of the state of the art in that area and other aspects of OA. Recent issues have examined overall OA planning Strategies, Workstations, OA Software, Personal Computers, and Management Support Systems.

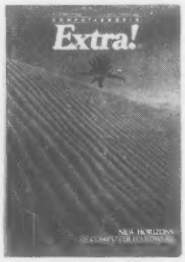


Our newest publication does for communications what OA does for Office Automation. *Computerworld on Communications* covers the fast-merging worlds of computers and communications with in-depth articles on important trends and current topics. Subjects which have been or are scheduled to be covered in *CW on Communications* in its two 1983 issues include: Voice and Data Communications, Local Area Networks, Communicating Personal Computers, Local Loops, Convergent Technologies, and Telecommunications Management.

Computerworld Buyer's Guides *are* a new type of reference source for the computer-involved professional. *CW Buyer's Guides* are broken down by topic, for easy reference, and include useful articles on that issue's topic, as well as complete company and product listings. With thousands of companies and tens of thousands of products now in the computer market, and new ones becoming available every day, these guides can be an indispensable reference source. Three *Buyer's Guides* are to be produced in 1983: *Computer Systems* (August); *Terminals and Peripherals* (October); and *Software* (November).



Computerworld Extra! is a special, extra issue of *Computerworld* which we publish from time to time in order to give extra attention to an important current topic. Every issue of *Extra!* is devoted entirely to a complete look at a single area of topical importance. Next Extra! is on Microcomputers.



As an information industry professional, you know that the right information at the right time can be invaluable. But this information service comes to you at a surprisingly modest cost. A full year's subscription to ALL of these publications is only $39 with our special introductory offer currently in effect! And there's even more good news:

If you subscribe using the form below, we'll send you a FREE copy of *Computerworld's Best Feature Articles of 1982.* This 96-page compilation of selected In-Depth articles was selected by our editors from the 1982 issues of *Computerworld, Computerworld OA* and *Extra!* to provide you with valuable insights and an important source for reference in the months ahead. It includes more than a dozen important articles such as "New Risks for MIS Managers", "Lessons from Wells Fargo" (on computer crime), "Legal Contracts" and "The User Wave in Information Engineering."

Free Bonus

With all this information at such a low price, there has never been a better time to get off the pass-along list and onto the subscriber list. Get your own subscription to *Computerworld,* and get the information you need *when* you need it.

Choose the subscription that suits you best:

☐ **1.** A full year of CW (including all the special publications), plus a free copy of "Feature Articles of 1982," all at the special introductory rate of only $39*, (a $5 savings from our basic rate of $44.00) with this coupon. (International Rates: Canada, Central and South America – $110; Europe $165; All Other Countries $245 – Airmail.)

☐ **2.** TWO year's worth of Computerworld and all the special publications, plus the free "Feature Articles" book, at the special rate of only $82* (a $6.00 savings from our basic two year rate of $88.00) with this coupon.

Please enter my subscription as checked above:

☐ Check enclosed ☐ Amex ☐ Visa ☐ MC (list four digits above name)

If Charge we must have

Expiration Date: _____ cardholder's signature: _____

☐ Bill Me (Subscription commences upon receipt of payment)

Name	
Title	
Company	
Address	
City	State Zip

Address shown is ☐ Business ☐ Home ☐ Check here if you do not wish to receive promotional mail.

* Domestic rate only.

You can mail this form in the envelope insert in this issue of *Computerworld,* or send it in your own envelope to: **Computerworld Circulation Department,** Box 897, Framingham, MA 01701-9985. Or you can take out your charge card and call us, toll-free, at *800-343-5730* (In Massachusetts, call 617-879-0700.)

1. BUSINESS/INDUSTRY (Circle one)

End Users
- 10 Manufacturer (other than computer)
- 20 Finance/Insurance/Real Estate
- 30 Medicine/Law/Education
- 40 Wholesale/Retail Trade
- 50 Business Service (except DP)
- 60 Government-State/Federal/Local
- 65 Public Utility/Communication Systems/Transportation
- 70 Mining/Construction/Petroleum/Refining
- 75 Other User_____

Vendors
- 80 Manufacturer of Computers, Computer-related Systems or Peripherals
- 85 Computer Service Bureau/Software/Planning/Consulting
- 90 Computer/Peripheral Dealer/Distributor/Retailer
- 95 Other Vendor_____

2. OCCUPATION/FUNCTION (Circle one)
- 11 President/Owner/Partner/General Manager
- 12 VP/Assistant VP
- 13 Treasurer/Controller/Financial Officer
- 21 Director/Manager/Supervisor DP/MIS Services
- 22 Director/Manager of Operations/Planning/ Administrative Service
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 35 OA/WP Director/Manager/Supervisor
- 38 Data Comm Network/Systems Mgmt
- 41 Engr/Scientific/R&D/Tech Mgmt
- 51 Mfg Sales Reps/Sales/Marketing Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other_____

3. COMPUTER INVOLVEMENT (Circle all that apply)

Types of equipment with which you are personally involved either as user, vendor or consultant
- A. Mainframes/Superminis
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

Wang Adds Net Components, VS 24, 45 Add-Ons

LOWELL, Mass. — Wang Laboratories, Inc. has enhanced its local-area networking capabilities with two networking components. It also announced the availability of its VS 24 and VS 45 systems packaged with various add-ons.

The Wangnet Technical Control and Management System (TCMS) is an integrated set of network monitoring, diagnostic testing and information management tools.

Operating on a dedicated Wang VS minicomputer, TCMS is said to compile information about the location, status and performance of every component in the network. TCMS costs $7,500, with shipments starting in August.

The Wangnet Cmux-3270 Cable Multiplexer is an interface device linking IBM 3270 peripherals with an IBM 3274 Control Unit (category A interface) over the Wangnet local-area network.

The unit is said to allow users to utilize Wangnet as a single transmission medium, thus eliminating point-to-point coaxial cables between control units and attached devices. The Cmux-3270, available next January, costs $3,375.

Also announced by Wang is the availability of VS 25 and VS 45 packaged with various add-ons such as workstations compilers, tape cartridge drives or disk cables.

The two VS 25 packaged systems are priced at $25,000 and $34,000, with respective monthly maintenance charges of $200 and $297. The three VS 45 packaged systems are priced at $48,000, $53,000 and $63,000, with monthly maintenance fees of $396, $498 and $557, respectively.

Wang is located at One Industrial Ave., Lowell, Mass. 01851.

Third-party terminal emulation software allows the IBM Personal Computer to run on Interlan's Ethernet-compatible network.

Interlan Net System Meets Ethernet, IEEE Standards

By Jim Bartimo
CW Staff

BOSTON — Interlan, Inc. has introduced a networking system and terminal server that meet the Xerox Corp. Ethernet and IEEE-802.3 local-area networ! standards. Also announced was third-party terminal emulation software said to allow 12 types of personal computers to work on Interlan's network.

The Net/Plus networking system offers communications for host-to-host, terminal-to-host, device-to-device, personal computer-to-personal computer, personal computer-to-host and personal computer-to-device applications. The network can function in concert with an Ethernet local network.

This capability is achieved through the use of the NTS10 Terminal Server, which can be used for port switching, port contention, resource sharing, personal computer networking and simplified wiring for dispersed terminals and printers.

The NTS10 contains either four or eight ports and can be daisy chained to share a common transceiver unit connected to the Ethernet local-area network. For network security, the terminal server offers programmable passwords said to protect against unauthorized connections to a networked device and unauthorized reconfiguration of an NTS10 port.

The terminal server is available for $3,200 for the eight-port unit and $2,500 for the four-port unit.

Also announced was file transfer and terminal emulation software available for 12 different personal computers, two microcomputer development systems and four host minicomputers. By attaching a personal computer's RS-232C communications port to one of the ports on an NTS10, the user can access a variety of resources on Ethernet, a vendor spokesman said.

Developed by Polygon Associates of Mayland Heights, Mo., the networking software includes the Poly-TRM Terminal Emulation and Poly-XFR File Transfer packages.

The Poly-TRM software converts a personal computer into a terminal for use on the network. The Poly-XFR provides transfer of binary and Ascii files over Ethernet. The software ranges in price from $150 to $200 per personal computer and is available for machines from Apple Computer, Inc., Digital Equipment Corp., IBM, Radio Shack and others.

All Net/Plus products will be available in September from Interlan, 3 Lyberty Way, Westford, Mass. 01886.

Data Net Links IBM Equipment

ORANGE, Calif. — CR Computer Systems has announced a local- and wide-area data communications network said to link IBM mainframes with the IBM 3278 synchronous terminal, IBM 3279 color graphics terminal, Digital Equipment Corp. VT100-compatible RS-232C standard synchronous terminal and the IBM Personal Computer and Personal Computer XT.

X-Net, the local networking system said to eliminate the need for IBM's 3274 and 3276 cluster controllers, has reportedly been enhanced to connect IBM hosts — including the IBM 4300, 30 series and 370, with DEC VAX-11, PDP-11 and non-plug-compatible mainframes.

Designed to link from 50 to 50,000 terminals, minis, peripherals and mainframes into a single shared system, X-Net is said to allow users to expand a computer system with a bus-based, single cable.

X-Net costs about $1,000 per connection from CR Computer Systems, 1145 W. Collins Ave., Orange, Calif. 92667.

DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS

SATURN-CALC

ELECTRONIC FORECASTING AND FINANCIAL MODELING

Available for immediate delivery

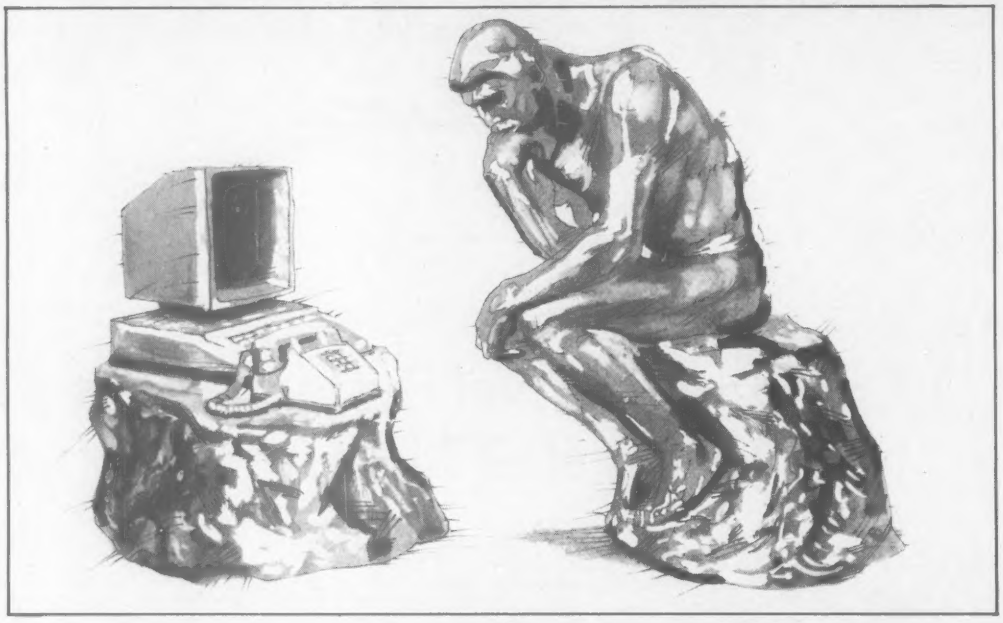
- Provides multiple worksheets in a file
- Outputs ASCII files compatible with WP SATURN and other applications
- Written in assembly language
- Supports most common CRT's — VT100, VT 52, ADDs, Hazeltine...
- Provides help text and prompts
- Supports variable width columns

FOR MORE INFORMATION CALL
800-328-6145

SATURN
SATURN SYSTEMS, INC.
6875 WASHINGTON AVENUE SOUTH, SUITE 218
MINNEAPOLIS, MN 55435 • 612/944-2452

DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS

All the great thinking in the world won't help if you haven't got the facts.



Computerworld on Communications

There's a whole lot happening out there in the *"Computerworld"*. A communications revolution is taking place. Suddenly you, as a DP/MIS professional, are being asked to make key decisions concerning new communications products and services. And not just data communications. This time you are being asked to be responsible for voice communications, video teleconferencing, orbiting data switches and value added carriers as well.

The actions of the FCC, the courts, and the Congress combined have created a new era of de-regulation and thereby have created a burgeoning new communications industry. New companies, new products, and new communications services are appearing daily -- all offering new ways to move information faster and more efficiently. And, as the communications revolution takes place, two industries begin to converge.

Let's face it. You, as a DP/MIS professional, are responsible for building the Corporate Information Systems of the future. And because of that responsibility you are increasingly involved with decisions that affect the communications capabilities of your organization. You'll have to analyze products, services, and technologies and combine them to build a communications network that will move voice and data within your site as well as throughout the world.

It's because of this new convergence of two technologies that *Computerworld* now introduces *Computerworld on Communications*. In this issue and future issues we'll cover the entire spectrum of communication issues. We promise to deliver information on communications that is in-depth, analytical and tutorial in style. And we also promise to deliver the leading experts and strategists to help you understand the rapid advances in communications technology that are being made. *Computerworld on Communications* will take a holistic, "big picture" approach that will help you to understand the broader issues that you face as a business communications user.

Computerworld on Communications will complement *Computerworld's* news coverage of communications with interpretive information on products, equipment, services and subjects, such as:

carrier value added services
communicating personal computers
communications processors
communications software
communicating word processors
concentrators
CRT terminals
electronic mail
facsimile equipment
fibre optics
front ends
government issues
hard copy terminals/teleprinters
intelligent terminals
interfaces/translators
local area networks
modems
multiplexers
network control systems
private line networks
private phone systems (PBX)
regulatory issues
satellites
technology
teleconferencing (video & audio)
test equipment
timesharing networks
voice mail/message systems
voice store and forward systems

Look for the next issue of *Computerworld On Communications* on September 28. Advertising space close is August 19. For more information call Don Fagan, VP Sales/Marketing, toll-free at 800-343-6474 (in Mass. 617-879-0700) or your local *Computerworld* representative.

***Computerworld on Communications* . . . because you deserve an explanation.**

Computerworld
On Communications

Sales offices:
Boston/Chris Lee, Ed Marecki, Joe Fitzhugh, Jim McClure, Kathy Doyle, (617) 879-0700
Chicago/Art Kossack, Newt Barrett, Jean F. Broderick, Chris Lee, (312) 827-4433
New York/Mike Masters, Doug Cheney, Ray Corbin, Joan Daly, Fred LoSapio, Gale M. Paterno, (201) 967-1350
Atlanta/Jeffrey Melnick, Mike Masters, (404) 394-0758
San Francisco/Bill Healey, Barry Milione, A.G. Germano, Theodora Franson, Ruth Gordon, Eileen Dunn, (415) 421-7330
Los Angeles/Bernie Hockswender, Bob Hubbard, Beverly Raus, (714) 556-6480

Says Act Discriminates Against U.S. Exporters

AEA Pushes Congress to Streamline EAA

By Robert Batt
CW West Coast Bureau

The American Electronics Association (AEA) has begun an intensive lobbying effort to persuade Congress to streamline the current Export Administration Act (EAA), which it claims is unfairly hampering U.S. technology shipments to allied countries.

In a recent bulletin sent to 2,300 chief executives in the computer and electronics industry, the AEA urged member companies to write to their congressmen in support of new export bills currently before the Senate and House of Representatives.

The current act, designed to prevent the export of sensitive technology to Soviet bloc countries, expires Sept. 30 and must be amended or extended before then.

Characterizing the EAA as "inefficient and discriminating against U.S. exporters in competition with companies in other Western nations," the AEA said no single law has complicated and constrained exports of U.S. high-technology products more than the current legislation.

'[The Export Administration Act is] inefficient and discriminating against U.S. exporters in competition with companies in other Western nations.' — American Electronics Association bulletin

"Too many shipments to free-world customers are controlled. Too many items are embargoed by the U.S. unilaterally, thereby handing our aggressive competitors in Japan and Western Europe additional markets and the jobs they might have generated in the U.S.," the AEA told industry executives.

According to the AEA, the bill currently before the House of Representatives (H.R. 3231) will streamline licensing procedures to make exporting easier and use scarce export control resources more efficiently. The Senate bill, sponsored by Sen. Jake Garn (R-Utah) and Sen. John Heinz (R-Pa.), also offers an improvement over the current law, the association asserted.

However, the AEA added, the Senate proposal is flawed in that it gives too much discretionary power to the Secretary of Defense to review exports. This, the AEA claims, has the potential for significant new delays and uncertainty in trading among the Western nations.

"We are not trying to scuttle legitimate security issues. Our thrust is to focus export controls on truly critical items and streamline control procedures, thereby strengthening both our national security and making exporting of legal items easier," explained Ralph Thomson, AEA vice-president, in an interview here.

While support for the bills in Congress appears to be gaining momentum, it is by no means certain that the Reagan administration will go along with the proposed amendments.

Assistant Defense Secretary Richard Perle said recently that the government will veto "a bad bill," one that does not adequately protect U.S. security interests.

Loren Sorensen, chairman of the AEA international committee, retorted that the current act is costing U.S. computer companies not only lost sales, but also future markets in the West.

"We are not talking about military sales; we are talking about dual-purpose items such as computers," Sorenson said. "The problem is that the Department of Defense wants to control everything and not allow anything out of the country that could be used other than commercially."

CW File Photo

Adam Osborne stared from behind the Osborne 1 when it was introduced in 1981. Of the five Osborne employees who flanked their boss in this picture, only one, Lee Felsenstein, second from left, still remains at the company.

Fierce Competition Forces Layoffs, Price Cuts at Osborne

By Patricia Keefe
CW Staff

"It's probably the result of the industry's moving so fast that the people and their businesses don't have time to mature before the next wave comes along. Many of them won't survive . . ." — Adam Osborne, commenting on the microcomputer market in the Nov. 17, 1982 issue of Computerworld Extra!

HAYWARD, Calif. — Sluggish sales and fierce competition in the portable computer market have forced Osborne Computer Corp. to fight back with a $700 price cut on the Osborne 1, the closing of its New Jersey plant and the layoff of at least 294 employees.

Despite Osborne's optimism in the face of rumors concerning its financial health, one industry analyst believes the company "is temporarily on the skids." Osborne, according to Chris Christiansen of The Yankee Group, a Boston-based market research firm, "will never regain its place as the industry leader," having lost considerable market share to competitors such as Kaypro, Inc.

Christiansen said that in addition to a recent announcement concerning the rescheduling of its debt, it was believed that Osborne "did not make any money in April" and was operating in the red as recently as June. Also, in a July 5th letter to its creditors, Osborne reportedly said that full payment of accounts payable would be delayed one month because of its "current tight cash position." However, company officials expect a new round of private financing, estimated at $20 million, to improve the portable computer maker's cash flow picture.

But signs of trouble are persisting. Less than a year and a half after its opening, Osborne closed its Monmouth Junction, N.J., manufacturing plant Aug. 2, laying off about 89 employees "with no recall," a

(Continued on Page 84)

Harris Acquisition Of Lanier Raising Sales, Tech Issues

By Bill Laberis
CW Staff

NEW YORK — The proposed acquisition of Lanier Business Products, Inc. by Harris Corp., announced last month, raises two questions: How well can the products of the two companies be integrated into the same environment, and can two very different sales forces achieve synergism in marketing automated office equipment?

The first question will be answered in the laboratory, where Harris will use its communications expertise in attempting to link its large systems with Lanier's stand-alone terminals and other office automation products.

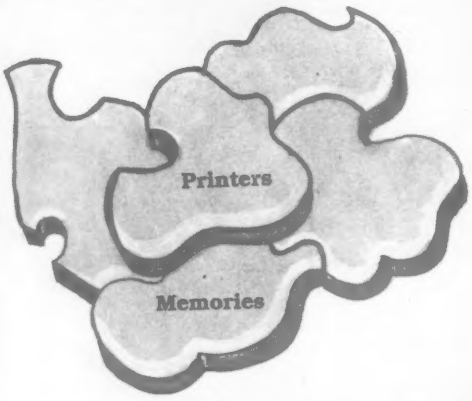
The second question was posed in a variety of ways by security analysts here recently, who pressed Harris Chairman Joseph A. Boyd for answers regarding the compatibility of the sales teams of each company.

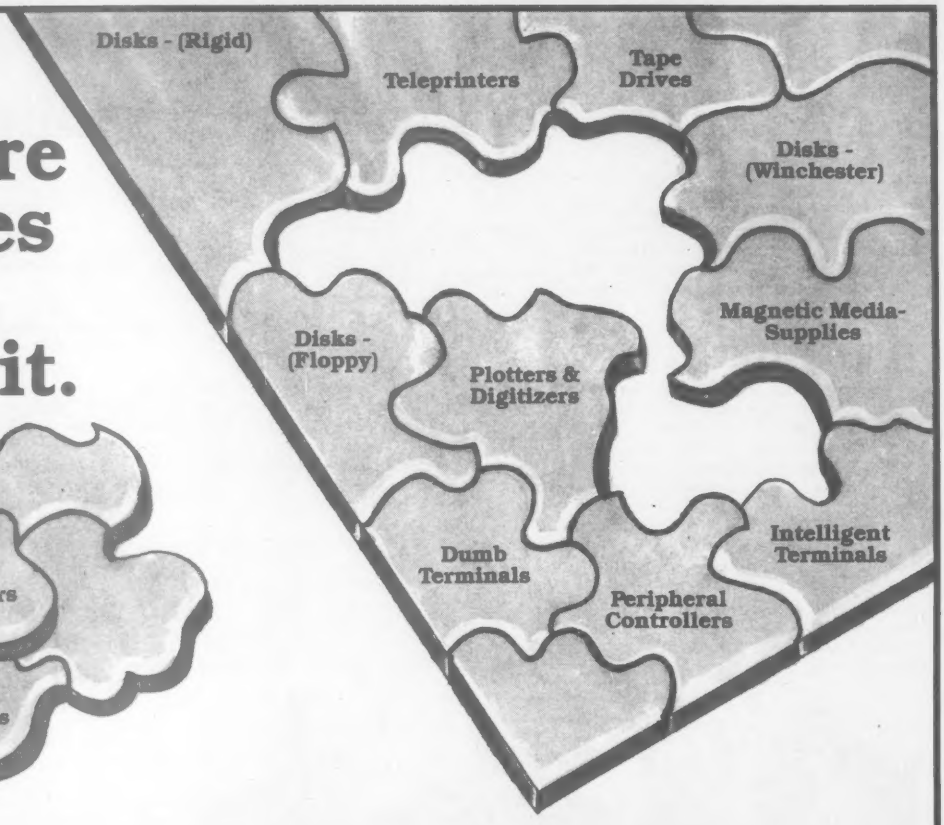
To date, the investment community has given the proposed acquisition anything but a vote of confidence. Harris stock was trading for $48 per share prior to the July 22 announcement, but was nudging the $38 mark early last week, having dropped 20% since the announcement.

Boyd attempted to allay Wall Street's anxiety, telling the analysts that "for a year, maybe two," Lanier will operate as a relatively autonomous fifth sector of the Harris organization. Harris, he said, does not want to upset the "very, very fragile things" that characterize the differences

(Continued on Page 91)

Make sure the pieces in your system fit.





The *Computerworld Buyer's Guide to Terminals & Peripherals* puts it all together for you.

Piecing together the right elements to build and complete a system for your organization is a complicated and time-consuming process. The constant flow of new products and rapidly changing technology presents a real challenge to those involved in planning and purchasing. The *Computerworld Buyer's Guide to Terminals & Peripherals* provides all the information you need to make the right choices for your system requirements.

The *Computerworld Buyer's Guide to Terminals & Peripherals* is the second in our buyer's guide series and provides detailed, all-inclusive listings and in-depth purchase decision information that DP professionals need as this market continues to grow. Listings are divided into two sections: complete product listings and vendor profiles. Product listings include name and model number, operating system environment, number of installations, delivery and price data, etc. Vendor profiles include company name, address, contact information, primary markets served and more. Tab dividers separate each category and cross references add to ease-of-use.

Buyers will refer to *Computerworld Buyer's Guide to Terminals & Peripherals* again and again for vital purchasing information. And advertisers will find this guide a powerful vehicle for telling their story to *Computerworld* subscribers at that crucial moment when they are actively seeking vendors.

The issue date for the *Computerworld Buyer's Guides to Terminals & Peripherals* is October 5.

The *Computerworld Buyer's Guides* are sent exclusively to the more than 111,000 *Computerworld* subscribers in the U.S. One more good reason to subscribe to *Computerworld*.

For more information on the *Computerworld Buyer's Guides*, call Kevin McPherson at (617) 879-0700 or your local *Computerworld* sales representative.

COMPUTERWORLD
BUYER'S GUIDE

Sales Offices:
Boston/Chris Lee, Ed Marecki, Joe Fitzhugh, Jim McClure, Kathy Doyle, Diane Sukey, *(617) 879-0700*
Chicago/Art Kossack, Newt Barrett, Jean F. Broderick, Chris Lee, *(312) 827-4433*
New York/Mike Masters, Doug Cheney, Ray Corbin, Joan Daly, Fred LoSapio, Gale M. Paterno, *(201) 967-1350*
Atlanta/Jeffrey Melnick, Mike Masters, *(404) 394-0758*
San Francisco/Bill Healey, Barry Millione, A. G. Germano, Theodora Franson, Ruth Gordon, Eileen Dunn, *(415) 421-7330*
Los Angeles/Bernie Hockswender, Bob Hubbard, Beverly Raus, *(714) 556-6480*

Fueled by Investment Rates

Japanese Chip Sales to Grow 18%

By Robert Batt
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — Japanese semiconductor sales, fueled by above average rates of investment, will grow by 18% a year over the next three years, reaching $84.4 billion by 1986.

This is the major conclusion of a report just released by the Semiconductor Equipment and Materials Institute, Inc. (Semi).

The 460-page "Japanese Semiconductor Industry Report," prepared for Semi by the Nomura Research Institute in Kanagawa, Japan, said that Texas Instruments, Inc. and Motorola, Inc. are the only U.S. chip manufacturers to have made any impact in the Japanese market.

At the same time, the report stated, overseas manufacturers can expect increased competition from Japanese semiconductor firms. "While 90% of the current total output of Japan-based semiconductor manufacturers is produced within the country, this ratio will gradually decrease, not only to prevent trade friction with advanced countries, but also to promote market development in advanced countries through closer contacts with customers," the report said.

Japanese integrated circuit (IC) exports to the U.S. rose 67% in the first half of 1983, compared with the same period last year, according to figures just released by the Japan Finance Ministry.

Total IC exports to the U.S. in the same period were at $327 million, while Japan's IC imports from the U.S. increased 17% to $188 million, the ministry said.

The top Japanese semiconductor manufacturers, like Nippon Electric Co. (NEC), Hitachi Ltd., Toshiba Corp. and Fujitsu Ltd., are actively promoting overseas production, chiefly in the U.S. and Southeast Asian countries.

Together with Mitsubishi Corp., these Japanese companies have combined annual sales of more than $4.7 billion, which has allowed them to invest heavily in semiconductor research and development, the report noted.

Much advanced equipment was developed through cooperative research efforts with either major manufacturers or government organizations, the report continued. "This research contributed greatly to the advancement of semiconductor production technology boosting Japanese equipment competitively," the report added.

The Japanese Semiconductor Industry Report is available for $495 for members and $895 for nonmembers from Semi, Suite 212, 625 Ellis St., Mountain View, Calif 94043.

'With Your Budget, May I Suggest an Abacus and a Ream of Paper.'

FOR IMMEDIATE LEASE OR SALE
3033 U16
3031 and 3032
3042-2
Call [203]357-6946
Equipment Placement Services,
260 Long Ridge Road,
Stamford, CT 06902
General Electric Credit CORPORATION
We buy, sell and lease new and used computers

Predictable.

A flawless future is in sight with 3M diskettes.

When it comes to keeping track of precious data, predictable means reliable. Being able to count on every diskette, every time. At 3M, reliability is built into every diskette. We've been in the computer media business for over 30 years. And we've never settled in. We're constantly improving and perfecting our product line, from computer tape and data cartridges to floppy disks.

3M diskettes are made at 3M. That way, we have complete control over the entire manufacturing process. And you can have complete confidence in the reliability of every 3M diskette you buy.

Look in the Yellow Pages under Computer Supplies and Parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M diskettes.

3M hears you...

3M

Computervision Inks Remarketer Pact With IBM

BEDFORD, Mass. — Computervision Corp. last week announced the signing of a pact whereby the company will order IBM-made software and hardware for integration into its computer-aided design and manufacturing (CAD/CAM) systems. Computervision and IBM are numbers one and two, respectively, in CAD/CAM system sales.

The agreement is a remarketer contract requiring Computervision to add significant value in software, hardware or both before selling to end users, the company stated.

The announcement follows acquisitions made by Computervision in the past several months, including Cambridge Interactive Systems of the UK, Grado of West Germany and the Organization for Industrial Research of Waltham, Mass.

The acquisitions and recent announcement will result in a new family of products for Computervision, the company claimed, including its Computervision Distributed System 4000 CAD/CAM system, a 32-bit turnkey system also announced last week and slated for delivery in September.

James Berrett, Computervision president, said the deal with IBM was struck "because of the unquestioned quality and capacity of [its] information management products.

"The significance of the announcement lies not in the contractual details, but in the fact that IBM will provide key product elements for our expanding market," he explained.

Slow Sales Force Osborne To Cut Prices, Close Plant

(Continued from Page 81)

spokesman for the plant said. Should sales improve, there are no plans to reopen the facility, which has been converted into a distribution center with a staff of 12.

Osborne's director of human resources, Jeffrey Boynton, explained that "the market has changed so much, we had to question the economy of keeping a satellite open on the East Coast. We've gotten to the point with our new product [the Executive] where we need fewer people and less time to produce units."

Osborne has further moved to beef up its sales by effectively putting some price/performance distance between the Osborne 1 and the Executive, introduced this spring at a starting price of $2,495. The price of the former machine has been reduced from $1,995 to $1,295. Demand for the Osborne 1 has slumped due to the introduction of the Executive and increased competition, according to analysts. Boynton said he expected the "discount program" to create heavier demand for the older unit. He also maintained that sales of the Executive are "according to plan."

This is not the case, according to Christiansen, who maintains that Osborne first "miscalculated the life cycle" for the Osborne 1 and then "never figured plans for the Executive would go that far awry." The vendor made a key mistake in announcing the Executive four months before planned shipments, he said.

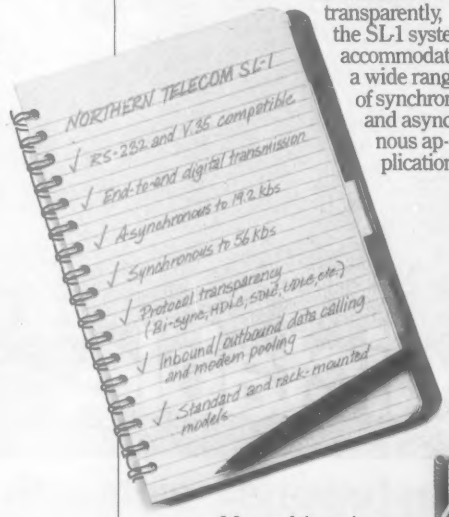
In doing so, the vendor inadvertently cut demand for the Osborne 1 as dealers decided to wait and restock with the Executive. When shipment of the Executive was delayed until June, dealers began to turn their attention to competing products.

The analyst also dismissed the "softening summer demand" theory postulated by company President Adam Osborne. "I don't see a summer slump affecting Kaypro or Compaq [Computer Corp.] sales," he said.

Dismissing growing criticism directed at the firm, Boynton said, "We're not as worried as the analysts are. We started this industry, and there are a lot of companies and analysts that would like to see us fail."

Northern Telecom's Your direct line to greater

We were the first to offer a digital PBX that integrated voice and data: The SL-1* system. Today its data handling capabilities make the SL-1 system a vital element in a complete information management system. The SL-1 system offers direct inbound and outbound data dialing. It allows communication between mainframes, terminals and other devices over standard telephone wiring. And because it switches data transparently, the SL-1 system accommodates a wide range of synchronous and asynchronous applications.



Many of the voice communications features of the SL-1 system can also be used for data calls. Convenience features like speed calling, ring again, and auto-dial. Economy features like least-cost routing and access restriction. Administration features that make relocating a data terminal or evaluating its use easy.

The SL-1 Displayphone puts integrated voice and data on any desk.

Asynchronous I/F Module for use with or without a single line telephone set.

Your Opening Move into the OPEN World.

The SL-1 digital PBX is at the heart of Northern Telecom's OPEN World.* The OPEN World is a rational approach to information management where voice, data, text, and image communications are integrated; where your information system grows to meet new needs; where different generations of equipment from many suppliers work harmoniously together.

The SL-1 system can function as the controller of your office's voice and data communications. It's part of a complete family of SL digital business communications systems that cost-effectively serve from 40 to 30,000 telephones. Find out why the leading digital voice communications system can also be the best data handling system. Call 1-800-621-6476 (in Illinois, call 1-800-572-6724). Or write Northern Telecom Inc., SL-1 Data Dept., P.O. Box 1094, Chicago, IL 60610.

OPEN World, the rational approach to information management. It's the best of all possible worlds.

Emerging AI Field Seen Taproot of Computing

By Tom Henkel
CW Staff

SCOTTSDALE, Ariz. — The next decade will decide whether DP professionals will become all-powerful corporate gods or wind up as outdated as elevator operators.

According to a soon-to-be-released report by DM Data, Inc., the taproot of the near-global reliance on computing is the emerging artificial intelligence industry. The impact AI will have on the data processing profession, however, is still unclear. Some argue DPers may wind up being done in by their own ingenuity, while others contend the power of the DPer can grow to near Herculean proportions.

By the end of this decade, AI is expected to have a $2 billion to $3 billion impact on business and industry, the report stated. AI will also help push computerization from the raised-floor environment of a data center to becoming integrated into virtually every part of a company, the DM Data report noted.

Major Players

Currently, the major players in the AI industry are a small group of individuals, university and corporate researchers, which make up about 30 companies, most posting annual sales of less than $5 million.

But the demand for AI is strong. DM Data said sales of AI products will grow to $2.5 billion by 1990, encompassing broader applications as electronic developments and software enhancements are made.

The real boom will take place soon after 1986 as the cost/performance ratio of AI products improves.

DM Data divided the AI industry into five broad categories: expert systems, natural language software, computer-aided instruction, visual recognition and voice recognition.

The segment of the industry expected to show the most dramatic growth and have the most significant impact on the DP department is natural language software, with a projected 80% compound growth rate through 1990.

With more natural language techniques being integrated into software packages, natural language techniques will grow to comprise more than 20% of the total software industry, topping the $1 billion mark by 1990, DM Data claimed.

Visual Recognition

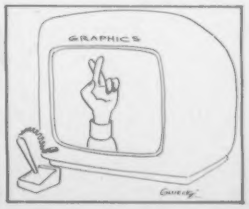
Visual recognition is also expected to undergo a compound growth of 55% over the next three or four years. The report said most of the applications of visual recognition will be restricted to stand-alone inspection, presenting less of a threat to the DPer than natural language software.

Fueled mainly by the U.S. military and Japanese, expert systems — or programs that offer advice based on the combined knowledge of several human experts in the field — will show some growth over the next three years. But there are still problems with the development of sophisticated expert systems. The cost, for example, can be rather high.

In order to become a viable component of a computer system, voice recognition systems have to become more accurate and flexible, DM Data suggested.

This, the report said, probably will not happen until 1986-87 when advancements in AI software techniques can be used to make voice recognition systems actually understand words, rather than checking spoken sounds against a stored template of commands, the report said.

The DM Data report is called "The Emerging Artificial Intelligence Industry." It costs $395, the firm said from 6900 Camelback Road, Scottsdale, Ariz. 85251.

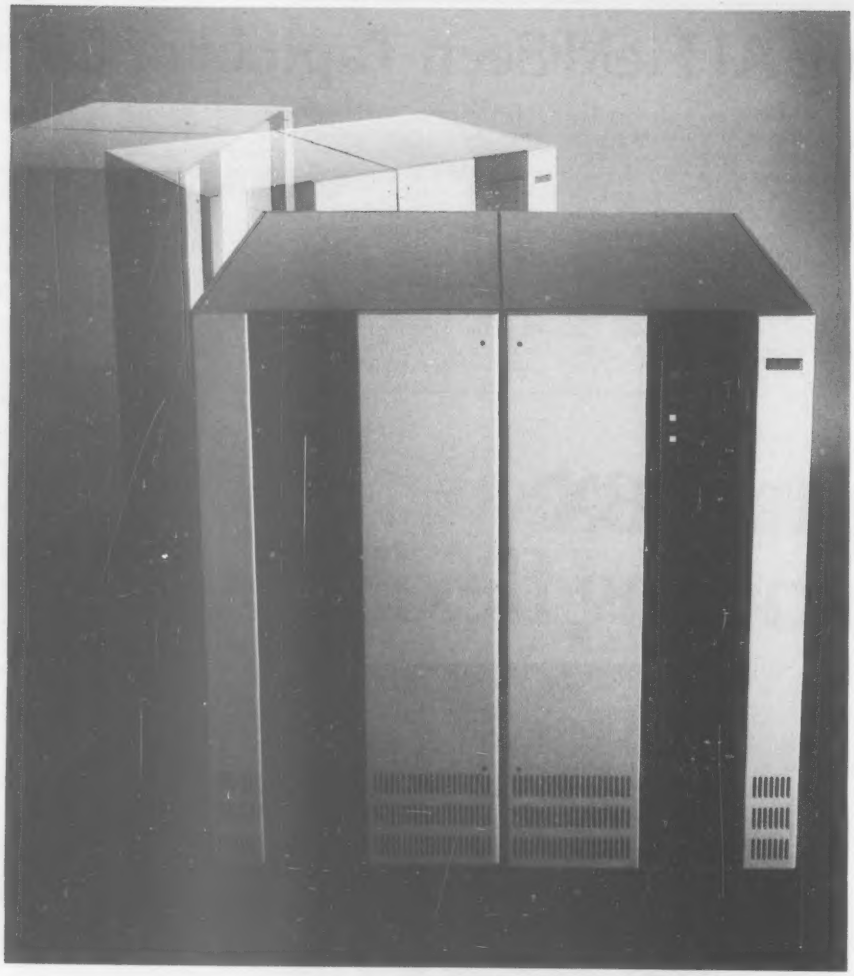


SL-1 digital PBX.
data handling flexibility.

Add-on Data Module for the electronic SL-1 telephone.

nt northern telecom

*Trademark of Northern Telecom Limited



INTRODUCING PRIME'S LATEST AND GREATEST.

THE PRIME 9950.
THE NEWEST AND MOST POWERFUL EXAMPLE OF OUR COMMITMENT TO TECHNOLOGICAL LEADERSHIP.

When we introduced the world's first virtual memory, 32-bit supermini we set the pace for leadership that still drives our business today.

For proof we offer the Prime 9950 – the most powerful, most technologically advanced computer we've ever designed.

It uses high speed emitter coupled logic – a rarity in minicomputers. Advanced pipeline architecture and unique branch cache memory allow five instructions to be processed in parallel and 255 user processes to be handled at once. 2MB memory boards allow you to economically configure systems up to 16MB. These technical advances provide the power, throughput and price/performance of the Prime 9950.

Like all Prime 50 Series systems, the Prime 9950 runs with PRIMOS, the operating system that makes it possible to easily and economically move software among all Prime systems, or upgrade your system without costly reprogramming or recompiling.

Add the reliability, availability and serviceability built into the Prime 9950 with its new diagnostic processor, and the result is a distinctive combination of a highly affordable, high performance computer, backed by the service and support you expect from a Fortune 500 company.

The Prime 9950. It's our latest and greatest technological achievement. And there's nothing else like it. Anywhere.

For more on the Prime 9950, or on the entire Prime family of compatible computers, call **1-800-343-2540** (Mass., 1-800-322-2450), or write Prime Computer, Prime Park, MS 15-60, Natick, MA 01760. In Canada call 416-678-7331. In Europe write, One Lampton Road, Hounslow Center, Hounslow, Middlesex, TW3 1JB, England. In the Far East, write Unit 1005, Tannery Block, 35 Tannery Road, Singapore 1334.

PRIME
Computer
Offices worldwide.

Study Predicts 15.9% Annual Growth Rate

Micros Seen as Vanguard of Industry Growth

WELLESLEY, Mass. — Computer industry shipments will reach $92.4 billion by 1984, up from 1980's $51.2 billion — but mainframe and minicomputer shipments will slow down while microcomputer shipments skyrocket, a new study released by Venture Development Corp. (VDC) predicts.

The report, *The U.S. Computer Industry, Second Edition*, forecasts a 15.9% annual growth rate for the industry for the 1980-1984 time period. Shipments for 1983 will increase only 14.1% over 1982, but 1984 shipments will grow 15.4%, the study said.

Computer systems and peripherals represented more than half the total industry shipments in 1980 and will do so in 1984. Mainframe sales will grow only 2.7% in 1983 over 1982 levels, and minicomputers will increase 15.6% in sales volumes, the study said, but personal computers will post a 35.9% gain in 1983 sales and pick up 4.9% of the overall market share.

"Business users [of personal computers] will increase 40% per year for the next two years," according to Melissa Yonge, market analyst for VDC.

"The home and hobby market will not prove significant to the personal computer market. The slower growth in the home is attributable to handheld and portable computers which crowd the personal computers out," she said.

The value of terminal and related shipments will grow 15% annually to reach $7.3 billion in 1984, according to the study, which predicted that alphanumeric CRT terminals will be the largest revenue producer.

Serial printer sales will gain in the total unit printer sales, but will lose share over four years to electronic typewriters.

Independent software suppliers will see a 20.6% growth in their market from $5.5 billion in 1980 to $11.7 billion in 1984. Application software will capture the largest increase in relative shares, growing from 21.6% of revenues to 27% in 1984, the study said.

The study costs $1,050 from Venture Development, One Washington St., Wellesley, Mass. 02181.

Executive Corner

- **William B. Nevers** has been elected senior vice-president, finance and administration, at Compucorp.
- **William Gimple** has been named vice-president of software development at Pyramid Technology Corp.
- **James Richard Ellis** has joined Integrated Office Systems, Inc. as vice-president of manufacturing.
- **Dick Popp** has been promoted to vice-president of product marketing at Paradyne Corp.
- **Jacob Ben-Zvi** has been promoted to vice-president, implementation systems development division, at Informatics General Corp.
- **David W. Schumaker** has been appointed vice-president, marketing programs, office and computer products, at Datapoint Corp.
- **Paul F. Fuller** has been appointed vice-president of software development at Applied Financial Systems, Inc.
- **Andy Reichert** has been promoted to senior vice-president of engineering and development at Vector Graphic, Inc. **Carlos Cardon** has joined the company as vice-president of engineering.
- **James G. Cole** has been named vice-president of sales for Syte Information Technology, Inc.
- **Lawrence J. Fortner** has been appointed vice-president, research and development, at Apollo Computer, Inc.
- **Edward R. Grant** has joined Amdahl Corp. as vice-president, division operations.
- **Joseph Anthony Krupansky** has been named vice-president of finance and chief financial officer of Fujitsu Systems of America.
- **Adm. Robert R. Inman**, chairman, president and chief executive officer of Microelectronics and Computer Technology Corp., has been elected to the board of directors of Tracor, Inc.
- **Michael I. Miller** has been elected vice-president and treasurer of Gould, Inc.
- **Lawrence J. Portner** has been appointed vice-president, research and development, at Apollo Computer, Inc.
- **James R. Donovan** has been named senior vice-president, corporate marketing, for McDonnell Douglas Automation Co.
- **Arthur E. Parsons** has been appointed senior vice-president, marketing and business development; **Jerome D. Barnla**, vice-president, corporate development and planning and **Roy K. Lewis Jr.**, vice-president, customer services at American Satellite Co.

Photo by Karsh

When this man speaks . . .

. . . Everyone who's anyone in the computer industry listens!

"It is the job of all executives now to build a computerized corporation."

THE JAMES MARTIN EXECUTIVE SEMINAR

A 1-DAY SEMINAR

Now it's your turn to hear the man the DP experts listen to!

Four electrifying and illuminating sessions for top management:

1. The Crisis in DP

Maintenance costs; multi-year backlogs; specification problems; systems which do not meet users' needs; inflexibility; lack of decision support computing; methodologies that cannot take full advantage of the explosive trends in technology.

2. Solutions to the DP Crisis

Information center; advanced development center; fourth-generation languages; information engineering; application generators; provably correct specifications; user-driven computing; decision support software.

3. Managing the Revolution

Three levels of strategic planning; fourth-generation methodologies; data administration; office automation; fourth-generation networks; information resource planning; distributed systems strategy; management organizations.

4. Entrepreneurs Who Will Get Rich

Future technology and the new opportunities it offers; new types of software; software factories; the threat of the Japanese; the automation of automation; an information systems manifesto.

Technology is going crazy. No business will be left unchanged by the current technological developments.

The single factor that will most affect the jobs of corporate presidents in the next five years will be new technology. It is changing manufacturing, the office, worldwide communications, information resources, and the management structure of enterprises. It makes many new products and services possible. It will make many old products and services obsolete. Characteristics and implications of the new technology will be explained.

Most executives are not obtaining the information most valuable to them from today's computer systems.

Traditional DP design and management do not obtain results rapidly. They work well in processing the payroll, invoices, and routine paperwork. They often fail to give end users what they really need at their terminals. They rarely give executives the management information they need most. They are inflexible, expensive, and slow, and they result in very high maintenance costs. Typical corporations have a three- to four-year backlog of cost-justified applications waiting to be developed. Most corporations have an even larger backlog of applications that **should** be developed but that have not yet been formally requested.

Because of the rapid rate of change of the technology, strategic planning is needed. This should create an integrated view of future resources and a plan for getting from here to there in easy-to-implement stages.

The spread of minicomputers, networks, distributed processing, end-user software, office-of-the-future technology, and data base systems all make it absolutely vital to have a corporate strategy for their evolution. The strategy must be oriented to achieving major increases in executive productivity and a major speeding up of application development.

Strategy and strategic planning methodologies are discussed.

Major management changes may be needed to achieve the synthesis of office-of-the-future systems, DP, and corporate telecommunications.

September 19, 1983
Toronto

September 20, 1983
Los Angeles

September 26, 1983
Atlanta

September 27, 1983
New York

For a complete brochure detailing James Martin Seminars, call or send the coupon today.

TECHNOLOGY TRANSFER INSTITUTE
741 10th ST. SANTA MONICA, CA 90402
(213) 394-8305

Name

Company Name

Address

City State Zip

Telephone

101 CW 8/15/83

Nashua Reaches Accord To Restructure Bank Debts

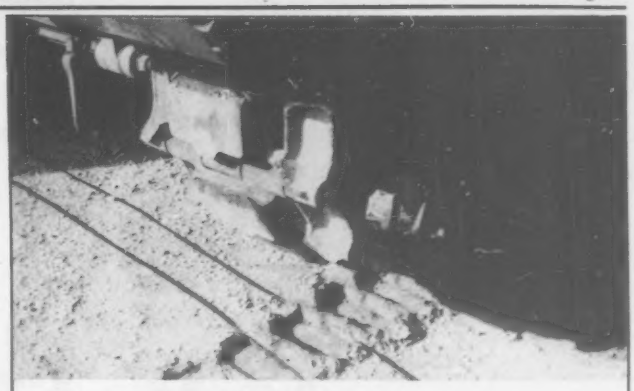
NASHUA, N.H. — Nashua Corp., plagued throughout 1982 with financial losses, has announced it has reached agreements with its creditors to restructure its outstanding bank debt on a worldwide basis. The agreements cover loans made both to Nashua and its subsidiaries.

Due to losses suffered last year, the company was unable to comply with loan repayment schedules. The new agreements, however, nullify all existing loan defaults, the office systems maker said.

Key provisions of the restructuring include: a schedule for periodic pro rata reduction of Nashua's bank debt, measures to collateralize debt with company assets, the imposition of limitations on levels of inventory and rental assets in Nashua's office systems business, a continued suspension of dividend payments and a limitation on capital expenditures that will still permit the company to carry out its plans for funding its computer products division and other growth businesses.

Commenting on the agreement, Charles E. Clough, company president and chief executive officer, said, "The financial limitations ... are consistent with our plans for strengthening the balance sheets and improving business operations worldwide.

In its most recent quarter, the company reported profits of $4.5 million or 96 cents per share.



Tanks for the Demo

To prove the durability of its fiber-optic cable, Fibronics International, Inc. of Hyannis, Mass., recently put the cable to the "tread test."

Print Industry Grows by 19%

NEWTONVILLE, Mass. — Spurred on mostly by the continuing sales growth of low-cost serial matrix printers and the healthy demand for daisywheel printers, the worldwide printer industry experienced growth in revenues to $7.76 billion in 1982, up 19%, according to a recent survey.

"Computer and Word Processing Printer Markets: Analysis and Projections," by Datek Information Services, Inc., said the growth trend is expected to continue, with this year's printer industry growth projected at 20% to 25%.

As the cost of low-speed serial matrix printers dropped and speed increased, the article said, the demand in the home, personal and small business markets grew to over $1.4 billion worldwide and has continued into this year as prices dropped to as low as $249 for a 50 char./sec unit. Comparable price reductions have also been seen on medium and high performance models.

Dramatic Price Reductions

Shipments and dollar values continued to flourish in the full character serial printer market also, as daisywheel and thimble-type printers racked up sales of 604,000 units, according to Datek, which publishes the analysis each year in the annual report. This market also was characterized by dramatic price reductions on new units and the emergence of a new class of low-priced, low-speed models.

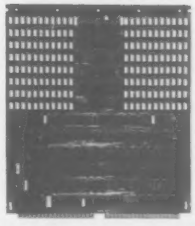
The expensive, high-volume printers such as line printers and nonimpact page printers were somewhat more susceptible to a slow economy, according to Datek, and registered disappointing growth with unit shipments remaining relatively flat compared with 1982.

Full-character line printers showed the effects of another year of tepid mainframe sales as shipments totaled 96,500 units worldwide, Datek said.

The publication is available for $25 per copy, postpaid in North America, from Datek Information Services, P.O. Box 68, Newtonville, Mass. 02160.

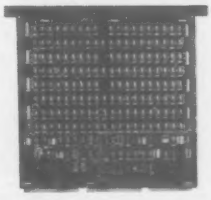
Memory Upgrades from EMC²

PRIME® users save $4,200



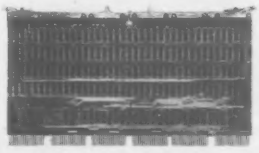
The PRIME Compatible E8 Memory Card with 1MByte Capacity, ECC, and Wide Word.

WANG® users save $7,000



The WANG VS-90 and VS-100 Memory Card with 1MByte Capacity and ECC.

digital VAX® users save $6,500



The VAX 730 and 750 VX Memory Card with 1MByte Capacity and ECC.

EMC²

EMC Corporation
385 Elliot St.
Newton, Ma. 02164
Tel: (617) 244-4740
TLX: 922531

385 Elliot Street
Newton, MA 02164

☐ PRIME
☐ WANG
☐ VAX

Please send me information about EMC MEMORY CARDS for the CPU family I have checked.

Name _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone _____ Ext. _____

® Registered Trademark of Prime Computer
Wang Laboratories
Digital Equipment Corp

6-83-CW

More good news for these Fortunate 500.

A. E. Staley
Alcoa Australia
Alcon Laboratories
Allergan Pharmaceuticals
Allied Bancshares
Allied Chemical
Alusuisse
Amdahl
American Bell
American Can Company
American Cyanamid
American Financial
American Hospital Supply
American Motors
American Natural Service
American Pharmaseal
American Telephone & Telegraph
American Ultramar
AMP Italia
Amsconia
Anderson Clayton
Anglo American
Applied Power
ARCO
Arizona Electric Power
Arizona State University
Arkla
Arthur Andersen
Asesoria de Empresas
Asesoria Y Servicios GIS
Ashland Oil Company
Askgaard Olesen
Atlantic Richfield
Austen & Butto
Bahrain Petroleum
Banca Nazionale Dell 'Agricoltura
Banco Itau
Bank of Montreal
Bank of Nova Scotia
Bankamerica
Barclays Bank International
Batus
Bavaria
B.C. Coal
Beacon Oil
Beckwith Manufacturing
Bechtel Power
Becton Dickinson
Bell Labs
Bell of Pennsylvania
Bergen Bank
Best Products
B. F. Goodrich
Bissell
Borregaard
Boston College
Boston Gas
Bowater
Bramalea
British Petroleum Australia
Brown and Root
Buckbee Mears
Burroughs
Business School of Oslo
Cable America
Cajun Electric Power Cooperative
Cal-Gas
Caltex Petroleum
Cameron Iron Works
Canadian Superior Oil
Canterra Energy
Carnegie-Mellon University
Calanese
Central Soya
CEPSA Petroleum-Spain
Cervecería Cuauhtemoc
CF Industries
Champlin Petroleum
Charcon
Chemplex Company
China Light & Power
Ciba-Geigy
Citicorp Acceptance Corp.
Citinational Australia
City Utilities
Clemente Jacques
Clemson University
Coastal Corporation
CODELCO
COFIDE
College of William and Mary
Colonial Sugar & Refining
Colorado-Ute Electric Association
Columbia Gas System
Comalco
Combustion Engineering
Commonwealth Industrial Gases
Conoco
Consolidated Aluminum
Consolidation Coal
Consorcio Papelero Mexicano
Container Corporation of America
Contel Data Services
Continental Illinois National Bank
Control Data
Cooper Tire and Rubber
COPEC
Corporativo Coral
Cotonifico Cantoni
Cox Enterprises
Cray Research
Cryovac
Cullen Frost Bankers
Dairyland Power
Daon Development
Dart and Kraft
Dekalb-Pfizer Genetics
Deloitte, Haskins & Sells
Delta Drilling
DePaul University
Detroit Edison
Digicon
Dillingham
Donne Petroleum
Dow Chemical
Dow Corning
Drazen-Brubaker
Dresser Industries
Dulux Paints
E.I. du Pont de Nemours
Duquesne University
Duval
Dyno Industrier
Eastern Associated Coal
Eastman Kodak
Echlin Manufacturing
Ecole des Hautes Etudes
Ecole Nazionale des Mines
E G Leasing
Electro-Scientific Industries
Emerson Electric
Energy Cooperative
Energy Reserves Group
Engelhard Industries
Environment Canada
Enviratech
E. R. Squibb & Sons
ESCOM
Especializados Tecnico Administrativos
Farmers Home Administration
Farmland Industries
Farmos
FDB Sentralen
First City Trust
First Interstate Services
First National Bank of Midland
Fisher Price Toys
Florida State University
Fluor
FMC
Ford
Frito Lay
Functionality Group
Fundidora Monterrey
F.W. Woolworth
Gaffney, Cline & Associates
Garrett Automotive Products
Gas Research Institute
Gas Services
G. D. Searle
GEISCO
General Electric
General Instruments
General Mills
General Motors
General Sekiyu
George Washington University
GHE Companies
Gifford-Hill
Gilbarco
Gold Kist
Golden West Broadcasters
Great Northern Nekoosa
Great Salt Lake Minerals
Group Cockerill-Sambre
Grupo Chihuahua
Grupo Condumex
Grupo Cydsa
Grupo Lamosa
Grupo VISA
GTE Automatic Electric
Guardian Industries
Guernsey & Associates
Gulf Air Company
Gulf Energy & Development
Gulf Oil England
Halliburton
Hallmark Cards
Hamilton Bank
Handelshakademiet
Harris Corporation
Harte-Hanks
Hawaiian Electric
HDR Systems
Health Care Service
Hebrew University
Helsinki School of Economics
Hercules
Hiram Walker Resources
Hoffmann-LaRoche
Holiday Inns of America
Homart Development
Home Federal Savings & Loan
Home Oil
Home Petroleum
Homestake Mining
Honeywell
Hughes Helicopter
Husky Oil
Hydro Quebec
ICA Service
Imatran Voima Oy
Indal
Indiana University
Industrias Monterrey
Ing. F. Selmer
Inmont
Inspiration Consolidated Copper
Intecom
Inter First of Texas
InterNorth
Interversa
Iona College
ISCOR
ISS Data
I. T. E. S. M. Monterrey
ITT North Telecommunications
Jennings Industries
Jones & Laughlin
Joseph E. Seagram & Sons
Kansas City Power and Light
Kelsey-Hayes
Kennecott Minerals
Kentile Floors
Kimball International
Komplek Kewangan
Kongsberg Vaapenfabrikk
Kreditkassen Bank
Kroger Company
Kroy
Kvaerner Engineering
Land-O-Lakes
Landsorganisationen
La Quinta Motor Inns
Leaseway
Lego Systems
Lend Lease, Ltd.
Libbey-Owens-Ford
Liberty Mutual Insurance
Lincoln Electric Systems
L. M. Berry
Loma Negra
London Transport Authority
Louisiana Land & Exploration
Louisville Gas & Electric
Lowes Companies
Magma Copper
Manitoba Data Services
Manufacturers Hanover Trust
Manufacturer's National Bank
Mapco
Marine Midland Bank
Mark Producing
Marquette University
Marriott Corporation
Marsh and McLennan
Mary Kay Cosmetics
Matra Harris
McGraw Edison
McGraw Laboratories
McKinsey and Company
Mead Corporation
Memorex
Merck and Company
Mercury Marine
Mesa Petroleum
3M
Mobay Chemical
Mobil Oil
Modern Merchandising
Molson Companies
Monsanto
Moog
Multi National Investment
Multibanco Comermex
Murray Financial
Mutual Hospital Insurance
Nabisco Brands
National Car Rental
National Semiconductor
Natural Gas Pipeline
Naturgas Syd
NEBB Norway
Newmont Mining
NEUCC
New Orleans Bank
New Zealand Industrial Gases
Nicor
NKI Skolen
Noranda Mines
Norcem
Norges Handelshoejskolen
Norges Shiplorsknings
Norske Olje
Norske Skog
North American Coal
North Carolina Municipal
Northeastern University
Northern Trust
Northwest Pipeline
Norwegian Carribean Lines
Norwegian Pulp & Paper Institute
Nova, an Alberta Corp
Oak Industries
Ohio State University
Oklahoma Gas and Electric
Omega Bartel
Ontario Hydro
Ontario Ministry of Government Services
Owens-Corning Fiberglas
Pace Financial Management
Pacific Resources
Packaging Corporation of America
Pan Canadian Petroleum
Panhandle Eastern Pipe Line
Paris Chamber of Commerce
PCA International
Peabody Coal
Pepsico
Perstorp
Pertamina
Peter Kiewit Sons
Petro Canada
Petro-Lewis
Petro Peru
Petroleum Corporation of New Zealand
Phillips Petroleum
Pigmentos Y Oxidos
Pizza Hut
Polaroid
Polysar
Ponderosa Industrial
Portland General Electric
Price Waterhouse
Prime Computer
Public Service Board of New South Wales
Public Service Co. of Colorado
Purdue University
Quaker Oats
Racal-Milgo
Rainier National Bank
Ralston Purina Company
RCA
Reading and Bates
Ready Mix Concrete
Reliance Electric
Rentco Europe
Republic Bank of Texas
Reserve Mining
Rice University
Rochester Telephone
Rockwell International
Rohm and Haas
Rollins
Royal Boskalis Westminster
RUNIT Technical School, Norway
Rutgers University
Sabritas
Sanlo
Salomon Brothers
Samaritan Health Service
Santos Ltd.
Sao Paulo Alpargatas
SAS Catering
Saskatchewan Oil and Gas
S. C. Johnson and Son
Seafirst Leasing
Seattle First National Bank
Sermo
Service Merchandise
Servicios Corporativos
Servicios Interindustrias
Servicios Liverpool
Shaklee
Shell
Shultan Canada
Sigma Motor
Signetics
Social Security Administration
Southern Methodist University
Southland Corporation
Southwest Bancshares
Southwestern Public Service
Souza Cruz
Sta-Rite Industries
Standard Bank Investment
Standard Oil of California
Standard Oil of Florida
Standard Oil of Indiana
Standard Oil of Ohio
State of Louisiana
State of Texas
Store Nordiske Telegraf
Stroh Brewery
Studsvik Energiteknik
Sugar Bowl Gas
Superior Oil
Syracuse University
Technical Research Centre
Technische Hochschule Darmstadt
Tenneco
Tesoro Petroleum
Texas A & M University
Thomas and Betts
Tiger International
Topeka Land
Toronto International Airport
Toyo Engineering
Tracor
Trane
Trans-Canada Pipelines
Transco Energy
Travenol Laboratories
Tricentrol Oil
Trilogy Systems
Triumph Adler
Tulane University
UCLA
Ultramar Canada
Ultramar Golden Eagle
Unibanco
Unicarb Industrial
Union Bank
Union Carbide Corporation
United Breweries
Universidad de Chile
Universita di Padova
University of Arizona
University of Calgary
University of Chicago
University of Colorado
University of Florida
University of Georgia
University of Hawaii
University of Houston
University of Idaho
University of Iowa
University of Manitoba
University of Massachusetts
University of Michigan
University of Minnesota
University of Missouri
UniverSity of Nebraska
University of North Carolina
University of Texas
University of Virginia
University of Wyoming
Urban Development Authority
U. S. Bancorp
USC
USDA
U. S. Fidelity & Guaranty
USI Capital and Leasing
U. S. Steel
U. S. Telephone
Valaro Energy
Valley National Bank
Valores Corporativos
Vesta Hygnea
Vitro Corporativo
Volkskas Group
Volkswagen of America
Vought
Warner Communications
Weingarten Realty
Welltech
Western Company of North America
Westinghouse
Westpac Banking Corp.
Wharton School
White Martins
Wilh. Wilhelmsen
Williams Companies
Wilson Learning
Wimpey of Canada
Woods Gordon
W. R. Carpenter
W. R. Grace
Xerox

Introducing IFPS/Personal. Decision Support System software uniting personal computers with mainframes.

Users in the organizations listed here can now achieve an unprecedented level of problem solving and decision-making support.

These companies already have the Decision Support capabilities of mainframe IFPS. With IFPS/Personal, they can extend those capabilities to the desktop. IFPS/Personal uses the same standard modeling language as mainframe IFPS—a language that lets managers describe complex business problems in their terms, not in technical jargon.

IFPS/Personal is the first DSS software package optimized for the personal computer, and we give it the same level of support our mainframe users enjoy now. That means that no other DSS software is better suited for the Information Center.

Become one of the fortunate 500. Call or write us today. Execucom Systems Corporation, 3410 Far West Boulevard, Austin, Texas 78766. **1-800-531-5038** or in Texas and Canada call 512-346-4980.

EXECUCOM

Acquistions May Come Slower To Encore Than Capital: Analysts

By Patricia Keefe
CW Staff

NEW YORK — Encore Computer Corp., a holding company for smaller technology concerns, is solidly staffed and will obtain all the growth capital it needs while still maintaining control of its operation, according to a number of Wall Street analysts.

However, these same analysts agree that acquisitions will not enter the Encore fold with quite the same speed likely to propel the flow of venture capital into the firm.

Because Encore President Kenneth Fisher, the marketing genius behind Prime Computer, Inc.'s earlier successes, has not been specific about the new venture's plans, the analysts interviewed based their opinions about the firm's future on the strength of its talent and current market conditions.

Encore was introduced to

(Continued on Page 92)

CW Photo by P Keefe

Kenneth G. Fisher (right), Encore founder and Henry Burkhardt, vice-president of Encore's corporate development.

Integration, Synergism Vital Points

(Continued from Page 81)

between the way each company is structured.

Lanier's 2,000-person sales force, including its 700-person word processing sales staff, is entirely commissioned-based. The sales force has been characterized by a high turnover rate in the first months of employment. Salesmen are accustomed to making five or six sales calls each day, registering many small sales with what some of the analysts called high-pressure tactics.

On the other hand, members of Harris' sales force are salaried, with many earning less than their counterparts at Lanier.

Like other systems salesmen, the Harris people court just a few customers at a time. And from a total systems point of view, they are generally more sophisticated than the Lanier sales staffers.

Commenting on Lanier's commission-based sales force, Boyd said, "We will let them continue to operate this way. They don't make a lot more than our people do, they're just paid differently. Those who don't produce don't stay."

Boyd also defended allegations of high-pressure tactics within the Lanier sales ranks, saying, "It takes guts to make six sales calls a day . . . If you call it high-pressure, I'd like to have some."

The differences in sales forces notwithstanding, Boyd added that a big part of Harris' ticket into the office automation arena will be written by the 700 Lanier word processing salesmen. Beginning next February, the 700 Lanier salesmen will market and support Harris' 9000 series word processing system, announced three months ago when Harris had no sales force to market it.

Boyd said the Lanier sales force may also market Harris' low-end private branch exchange, which to date has been sold to OEMs only.

The Harris international sales force will begin marketing Lanier's stand-alone terminals, particularly in Europe, Boyd said.

Choose the publications you need to keep up with your part of the computer world.

We are the world's largest publishers of computer-related newspapers and magazines, serving more than three-million computer-involved people in more than 20 countries around the world. And we have a publication to suit *your* needs.

Computerworld is THE weekly newspaper for the computer community. Complete, objective coverage of the use of computers and computer technology in large to medium organizations — from mainframes to micros, office automation to communications. More than 500,000 computer user and computer industry executives rely on CW for the news they need. Annual subscription of $44 includes special, extra issues of Computerworld OA *(covering office automation),* Computerworld on Communications, Computerworld Buyer's Guides, *1983 issues include* Systems and Peripherals, Terminals, Software and Computerworld Extra! *(covering microcomputers)*

InfoWorld is the newsweekly for microcomputer users. IW's complete coverage of all the latest news includes up-to-the-minute announcements of new hardware and software products, as well as detailed, independent reviews of the most significant hardware and software products for all major brands of microcomputers. Annual subscription of $31 includes special extra *REPORT CARD* issues with compiled reviews for easy reference.

PC World is our monthly magazine for users of the IBM PC and compatible computers. Each issue is packed with the information you need to get the most out of your PC, from hardware to software news and reviews to useful applications of your computer. There's no better way to make the most of your investment. Annual subscription is $24.

ISO World is our semi-monthly tabazine for Independent Sales Organizations, including retailers, dealers, distributors, systems houses and other resellers of computers or computer-based products and services. For subscription information please complete the coupon below and mail.

To enter your subscription, use the coupon below — or take out your charge card and call, toll-free, 800-343-5730 (in Mass., call 617-879-0700).

CW COMMUNICATIONS/INC.
To: Circulation Dept., CW Communications/Inc.,
Box 880, Framingham, MA 01701

☐ Please enter my one-year subscription to the publication(s) I have checked.
(If you wish only to get further information on a publication, just circle the name.)

☐ Computerworld-$44* ☐ PC World-$24*
☐ InfoWorld-$31* ☐ ISO World
*USA ONLY

☐ My check is enclosed ☐ Charge to my credit card
☐ MC ☐ Visa ☐ Amex Exp. date _____
(MC only)

Name _____
Company Name _____
Address _____
City _____ State _____ Zip _____
Address shown: ☐ Business ☐ Home ☐ Send foreign rates
Signature _____
(Cardholder's signature)
☐ Check here if you do not wish to receive relevant promotional mail.

116

Encore's Management Line Seen Key to Success

(Continued from Page 91)
the press and Wall Street last month as an operating company looking to acquire small firms offering unique products in need of marketing, financial and administrative savvy — which Encore will provide. It will be an integrated manufacturing and marketing company serving worldwide markets, a spokesman said.

Said to be the first holding company of its kind in the computer industry, Encore is unlikely to encounter any problems in obtaining financial backing, according to industry analysts. "Some venture capital organizations have called me about investing in Encore," Marc Schulman, vice-president and analyst at First Boston Corp. here, said.

'Never Again'

Regardless of the kind of financial backing Encore is able to line up, Schulman said he was sure of one thing: "Ken Fisher will maintain control of Encore; by that I mean he will own more than anyone else. At Prime, he didn't have that control and we saw what happened there. [Fisher left Prime after several differences with Chairman David J. Dunn.] I'm sure he made a promise to himself of 'never again.'"

Although Fisher has stated Encore will not be going public within the near future, Schulman and Fred Cohen, a senior analyst with L.F. Rothschild, Unterberg, Towbin, guessed that it will do so by fall of 1984. Schulman said it would be unwise to wait until 1985, which would be early in the next presidential term when, historically, the business cycle is down.

While lauding the strength and experience of Encore's management lineup as key to its success, Schulman was less enthusiastic about the probable success of "encores to Encore."

A limiting factor in the proliferation of these types of umbrella ventures would be a serious lack of very senior-level management people capable of and willing to carry off similar ventures, the analyst said.

Cohen said it was "a real coup" on Fisher's part to have gathered the talent he did; however, he is not so sure that Fisher's venture will be "a screaming success. I'm not satisfied with the vast success they see for themselves," he said. "It will be less of an easy street than when Fisher joined Prime."

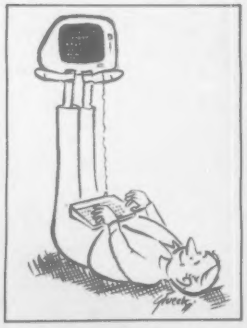
There is an abundance of both venture capital and marketing talent these days available to start-ups with good products, Cohen said.

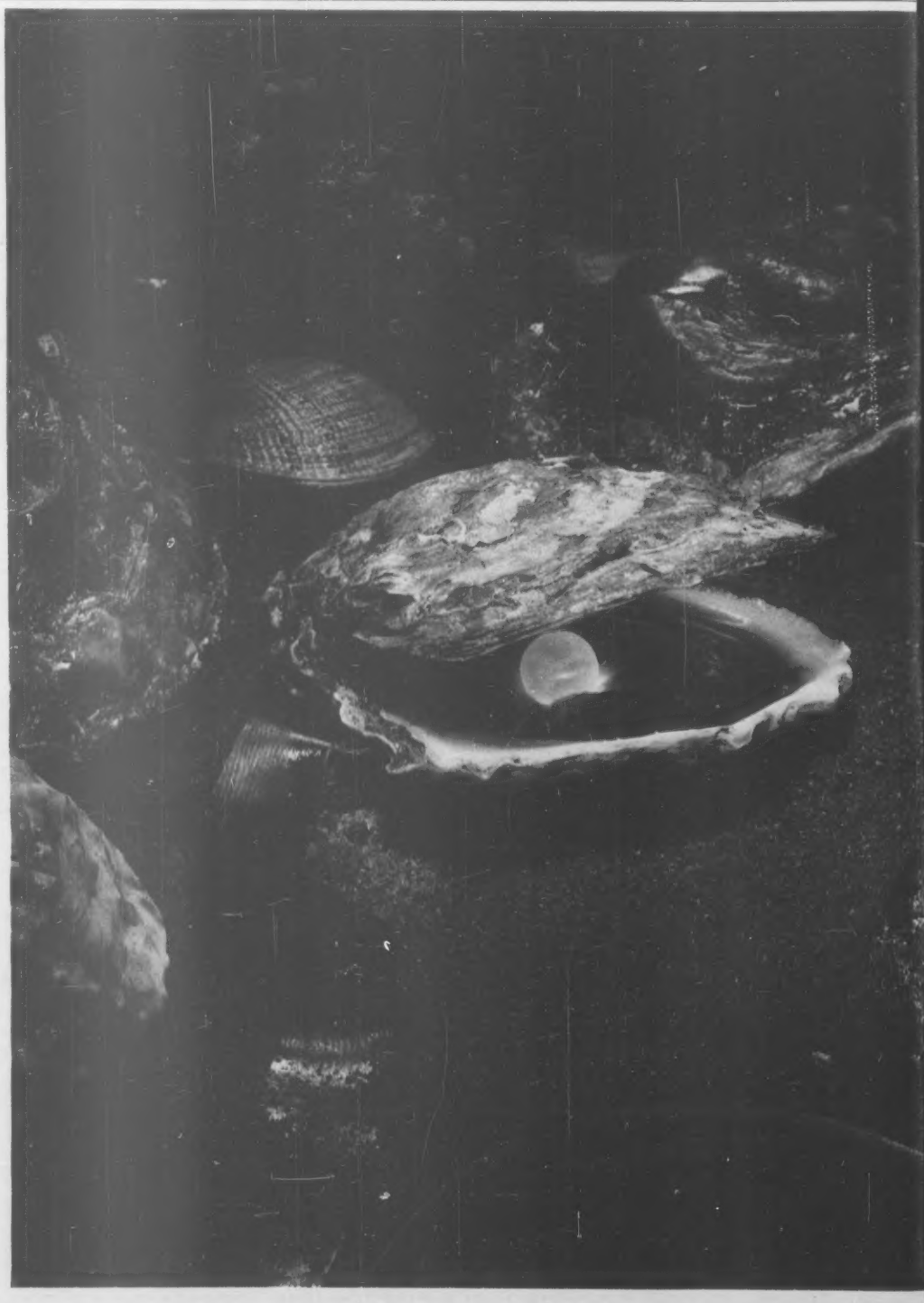
He pointed to venture capital outfits such as the New York-based Sevin, Rosen, Bayless and Borovoy, which the senior analyst said can provide substantial operating experience and manufacturing connections with less overhead, as compared with Encore.

In addition, he pointed out that the cornucopia of available capital today will make it easier for entrepreneurs with innovative ideas who need financial backing, yet want to shape their own enterprise, to ignore overtures from Encore.

Another industry observer suggested Encore "had better" have two to three arrangements lined up by the end of the year, four or five by the end of 1984. He said that of the 100 or so start-ups that Fisher has been studying over the past year, Fisher told analysts that half the companies are not interested and another quarter Encore does not want.

"With the slush of venture capital available, the remaining firms under consideration could easily go out on their own," he added.





Nickels & Dimes

Tandy Corp. has reported preliminary sales for the fiscal year ending June 30, 1983, of $2.5 billion, 22% over fiscal year 1982. Consolidated sales for the month of June were $200 million, an increase of 15% over June 1982.

$$$

Dataproducts Corp. has reported revenues of $80.7 million and net income of $2.9 million or 15 cents per share for the fiscal quarter ending June 25, compared to revenues of $71.9 million and net income of $2.5 million for the same period last year.

$$$

Plantronics, Inc. has reported sales of $114 million for the fiscal year ending May 28, an increase of 3% over sales of $110 million in fiscal 1982. Earnings were $8.2 million or $1.27 per share, compared to $9.7 million or $1.50 per share for the previous year.

$$$

Equatorial Communications Co. has filed a registration statement with the Securities and Exchange Commission for an initial public offering of 2.2 million shares of common stock. Alex Brown & Sons and Robertson, Colman & Stephens will manage the underwriting group.

$$$

Triad Systems Corp. has reported revenue for the third quarter ended June 30 of $17.3 million, compared to $18.6 million for the same period last year.

$$$

Apollo Computer, Inc. has reported 1983 second quarter net income of $3.8 million or 19 cents per share, compared with a net loss of $199,000 or 5 cents per share for the same period in 1982. Sales for the six months ended July 2 were $31.7 million, more than six times the net sales for the first six months of last year.

$$$

Stratus Computer, Inc. has filed a registration statement with the Securities and Exchange Commission covering an initial public offering of approximately 3 million shares of common stock. The offering will be managed by Morgan Stanley & Co., Inc.; Alex Brown & Sons; and Hambrecht & Quist, Inc. Quist, Inc.

$$$

Systematics, Inc. has reported net income for the year ended May 31 of $4.7 million, a 45% increase over fiscal 1982.

$$$

Informatics General Corp. has reported revenues of $87.9 million for the six months ended June 30, a gain of 11% over the first half of 1982.

$$$

Plantronics, Inc. has reported sales of $114 million for the fiscal year ended May 28, an increase of 3% over fiscal 1982. Earnings were $8.3 million or $1.27 per share, compared to $9.7 million or $1.50 per share for the previous year.

$$$

AT&T has declared a dividend of $1.35 on its common stock, payable Aug. 1, 1983, to shareholders on record June 30, 1983.

$$$

Sparticus Computers, Inc. has received $3 million in venture capital funding, with the largest investment coming from Oak Partners II, Westport, Conn. Other investors are: Ventech Partners, Avon, Conn.; Robertson, Colman & Stephens, San Francisco; Cowen & Co., Boston; Bank of Boston; High Technology Lending Group, Boston; and MIT.

$$$

Tektronix, Inc. has reported earnings of $48.7 million or $2.57 per share for the fiscal year ended May 28, a 39% decrease over the same period last year.

$$$

Verbatim Corp. has reported net sales of $119.8 million for the year ended July 1, a 41% increase over fiscal 1982. Net income was $14.2 million or $1.27 per share, a 52% increase over last year.

$$$

Computer Task Group, Inc. of Buffalo, N.Y., has reported revenues for the first half of 1983 of $24.2 million, an increase of 22% over the same period last year.

THIS IS ONE FORM OF SUPERB SECURITY.

OUR SOFTWARE IS ANOTHER.

Our ACF2, Access Control Facility, is innovative and non-traditional software that's become the standard of security software for MVS, VS1, and VM users.

A security software system so very good, so very sophisticated, that over 1000 leading organizations use ACF2 to protect their data.

It is, in fact, *the most widely used security software system* on the market today. It's software that offers unparalleled protection for your valuable and vulnerable data. Protection against unauthorized disclosure, modification and destruction.

The reason for ACF2's success is due to its ability to protect all data by default with minimal machine or people overhead. We call this Implicit Security. And it allows you to decide exactly what is to be made available and to whom. ACF2 assures liability and responsibility reside specifically with those responsible for the data.

ACF2's transitional capability is also of important consequence. This allows easy movement from an unprotected environment to one where all the data is safe.

Of course, the reduction of overhead has also been instrumental in ACF2's success story because the system allows "access rules" to be interpreted with minimum I/O activity.

ACF2 also has real-time monitoring capability, along with detailed, comprehensive audit trails to detect instances of attempted unauthorized access, both when it occurs and after-the-fact. So you not only receive accountability, but also auditability.

For a presentation of ACF2 or further information on the Cambridge A**2 family of high performance software systems, we invite you to call Shawn McLaren direct: 415/941-4558.

He'll be glad to tell you about a security software system that ensures the world remains your oyster.

The Cambridge Systems Group

24275 Elise, Los Altos Hills, CA 94022, U.S.A., (415) 941-4558 • Telex 357437

CW 8/15/83

ACF2 is developed by SKK, Inc., Rosemont, Illinois.

Nickels & Dimes

Xerox Corp. has reported a slight decline in earnings for the second quarter and first half year, but income from Crum & Forster Corp., a recently acquired insurance subsidiary, has boosted earnings per share for the first half by 7 cents to $2.66. Second quarter net income was $153 million, compared with $161 million for last year. Half-year net income was $282 million, up from $271 million in 1982.

$$$

Ask Computer Systems, Inc. has reported revenues of $39.4 million and net income of $3.9 million for the fiscal year ended June 30, up 58% and 45%, respectively, from last year.

$$$

NBI, Inc. has reported revenues for the fiscal year ended June 30 of $120.9 million, an increase of 21% over last year. Net income was $4.6 million, down 58% from fiscal 1982.

$$$

Software AG Systems Group, Inc. has reported revenues for the fourth quarter ended May 31 of $8.9 million, a 24% increase over the same period last year. Revenues for the year increased 22% to $30 million while net income increased 29% to $1.2 million.

$$$

Convergent Technologies, Inc. has reported revenues for the second quarter ended June 30 of $42.5 million, compared with $16.5 million for the same period last year. Revenues for the first half were $79.9 million, compared with $24.4 million last year. Earnings for the half were $7.8 million or 21 cents per share, compared with $3 million or 12 cents per share for the first half of fiscal 1982.

$$$

Docutel/Olivetti Corp. has reported revenues for the second quarter ended June 30 of $58.1 million, compared with $22 million for the same period last year. First-half revenues were $109.9 million, up from $40 million for the first half of 1982.

$$$

Paradyne Corp. has reported revenues of $48.5 million and a net loss of $919,000 for the second quarter ended June 30, compared with revenues of $48.5 million and a net income of $6.6 million for the same period a year ago.

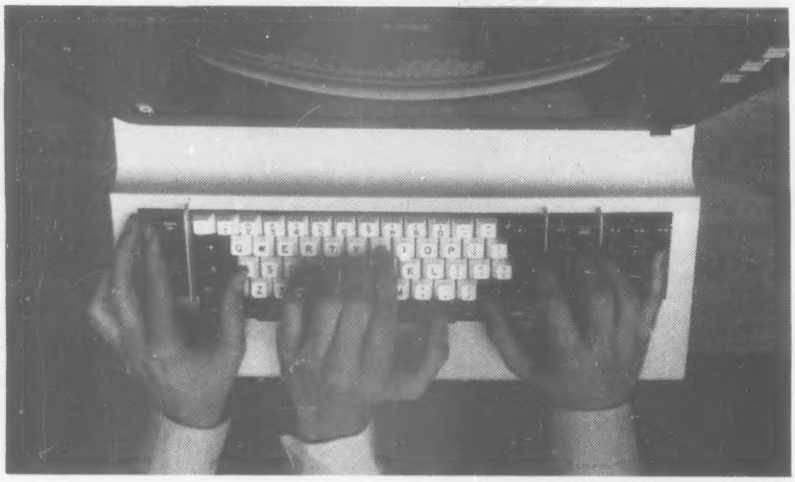
$$$

Applied Magnetics Corp. has reported net sales of $69.7 million and net income of $4 million for the nine months ended June 30. Net sales and net income for the same period last year were $67.9 million and $6.5 million, respectively.

$$$

MCI Telecommunications Corp. plans to file a registration statement with the Securities and Exchange Commission covering a public offering of 500,000 units, each consisting of $1,000 principal amount of 10-year subordinated notes and 17 five-year warrants to purchase common stock.

Double Productivity for the Entire Development Center or Send It Back!



DEVELOPMENT CENTER TECHNOLOGY TODAY -
The first and only comprehensive, integrated approach.

We know what the Hogan UMBRELLA™ can do because we used it first.

This complete, automated approach to interactive development—design, management, programming implementation and maintenance of both on-line and batch applications—was critical in development of our own highly successful line of big bank applications software.

And here's what other users say:

☐ "With the Umbrella, we beat our estimates by 50% on our very first project and that included our education time on the Umbrella." **—Large CICS/DLI user.**

☐ "We looked at over 100 productivity tools. Nothing in the market is even close to the Umbrella and it has minimum CPU impact." **DOS/CICS user.**

☐ "I can finally produce functional prototypes." **—Large CICS/VSAM environment.**

☐ "Gives complete data and environmental independence for applications. That includes restructuring or changing of physical data bases or communication monitors with no change in application code." **—Large IMS user.**

There's a lot more the Hogan UMBRELLA can do for you. Ask more than 70 users . . . various combinations of DOS, VS, MVS, IMS, VSAM, CICS, IDMS. And ask Ed Lomax, UMBRELLA Marketing Director, about our trial rental program at 214/386-0020.

Call me with more info on your UMBRELLA™ System.

Hogan SYSTEMS

Name: _____ Title: _____
Company: _____
Address: _____
City: _____ State: _____ ZIP: _____
Phone: _____

Corporate Headquarters: 5080 Spectrum Drive, Dallas, TX 75248 ☐ Offices: Atlanta, Boston, Chicago, Dallas, Detroit, Los Angeles, New York, Australia, London, New Zealand ☐ TELEX 910/861-4122 ☐ (Traded "HOGN" OTC)

Mergers & Acquisitions

E.F. Industries, Hawthorne, Calif., has purchased all the assets of **Datum, Inc.** for an undisclosed amount of cash. Datum's minicomputer controller products will become part of the line offered by Computer Storage Technology, Inc., a new company operated by E.F. Industries.

* * *

A. Johnson & Co. has acquired all outstanding stock of **Hekimian Laboratories, Inc.** of Gaithersburg, Md., a manufacturer of microcomputer-based telecommunications test equipment.

* * *

Computervision Corp., Bedford, Mass., has reached an agreement in principle to acquire **Organization for Industrial Research, Inc.** of Waltham, Mass., in exchange for Computervision stock.

* * *

Computer Resources, Inc., Cleveland, has reached an agreement to acquire **Tape Research, Inc.** of Cary, Ill.

* * *

Computer Task Group, Inc., Buffalo, N.Y., has acquired **Automated Business Systems, Inc.** of Rochelle Park, N.J.

* * *

Wang Laboratories, Inc. has acquired **Dictronics Publishing, Inc.**, a New York City-based software firm, and has merged the company with Wang's wholly owned subsidiary, Wang Electronic Publishing, Inc.

* * *

Sterling Software, Inc., Dallas, has signed an agreement in principle to acquire **Pacesetter Systems, Inc.**, also of Dallas.

* * *

Automatic Data Processing, Inc. has acquired GTE Telenet's brokerage services business, **GTE Telenet Information Services.**

* * *

Management Science America, Inc. has acquired all the outstanding stock of **Edu-Ware Services, Inc.** of Agoura Hills, Calif., a supplier of educational microcomputer software, for a combination of MSA stock and approximately $1.5 million and some deferred payments based on future revenues.

Join the experts at the world's first conference & exposition devoted exclusively to office systems integration.

INTECH
Integrated Office Technology '83
Conference And Exposition

Today's automated office is rapidly becoming tomorrow's integrated office. And INTECH '83, the Integrated Office Technology Conference and Exposition, is the first and only forum in the world devoted exclusively to office systems integration.

October 31 - November 3, 1983
• McCormick Place
• Chicago

INTECH '83 brings the various components of today's corporate information systems together under one roof. Communications, office automation and data processing are no longer separate camps and the many marriages caused by continued high technology achievements are creating an undisputed overlap of professional capabilities and responsibilities. INTECH '83 bridges the gap between the technologies with four days of intensive seminars and exhibitions that will help top-level management take their organizations into the 21st Century.

Keynote Speaker:
John Diebold — internationally acknowledged expert and founder and chairman of the Diebold Group, Inc.

Integration Theatre

INTECH '83 features a new concept in session presentation with this theater-in-the-round approach. The Integration Theater is a unique and special format ideally suited for the world-class speakers and the panels and sessions to be held here. These internationally renowned consultants and their topics include:

- Dr. Michael Hammer, President, Hammer & Co.
  "Managing Micros in the Corporate Information System"
- David Friend, Special Consultant
  "Graphics: New Management Solutions"
- Will Zachman, VP, Technology Assessment, IDC
  "Microprocessor Impact on Systems and Uses"
- Dr. Howard Frank, President, ConTel Information Systems, Inc.
  "Local Networks: Before You Get One"
- Dr. Howard Morgan, Chairman, Advanced Office Concepts
  "Solving DP/WP Integration Problems"
- Edward Horrell, President, Mitchell & Horrell, Inc.
  "Integration through CBX Technology"
- Dr. John McQuillan, President, McQuillan Consulting, Inc.
  "Strategic Planning for Integration — Who, How, When & Why"
- Harry Newton, President, The Telecom Library
  "Personal Career Advancement Through Embracing Office High Technology"

Exhibits

There will be over 400 exhibits by leading information companies with the latest vendor architecture and technologies available. Special time is set aside for conference attendees to view all the exhibits and talk first-hand to the vendors. Exhibit hours are 12:00-6:00 p.m. Tuesday, 10:00 a.m.-6:00 p.m. Wednesday, and 10:00 a.m.-5:00 p.m. Thursday.

Conferences

Professional seminars and discussions concerning state-of-the-art-technologies will be led by the foremost experts in the field. It is the first time so many of the best and most renowned industry speakers will be gathered together under one roof to discuss the integration of communications, office automation and data processing.

General Sessions will be presented by professionals with 'hands-on' experience — professionals who have actually lived through the experience tell their stories and offer suggestions and solutions. Here's a sampling of the general session topics:

- *"Satellite Networks"*
- *"Network Intelligence"*
- *"The Multifunction Workstation"*
- *"Pilot Projects: Corporate PC Acceptance"*
- *"MIS — OA: Resolving the Conflicts"*

Will Zachman
International Data Corporation

Dianna Last
Honeywell Educational Services

In-Depth Tutorials

On October 31 some of the nation's leading consultants take the platform for a full day's formal instruction. These four concurrent in-depth tutorials include lecture notes, lunch and a reception with the speakers.

A — *"Corporate PC Management"* — Dr. Michael Hammer, Hammer & Co.
B — *"Advanced CBX Applications"* — Edward Horrell, Mitchell & Horrell
C — *"Local Area Networks"* — Dr. Ken Thurber & Dr. Harvey Freeman, Architecture Technology Corp.
D — *"Strategic OA Planning"* — Dr. John McQuillan, McQuillan Consulting

Dr. Ken Thurber
Architecture Technology Corp.

Dr. Larry Harris
Artificial Intelligence, Inc.

Register Now!

To register, or for more information, call Louise Myerow, Registration Manager, toll-free 800-225-4698 (in Mass., call collect 617-879-0700). Or return the coupon below.

INTECH '83 is sponsored by National Trade Productions, Inc. with conference program coordinated by the Conference Management Group of CW Communications/Inc.

McCormick Place — Chicago

INTECH '83 takes place in the superb facilities of McCormick Place, located on Chicago's beautiful lakefront.

Excellent Accommodations

Convenient accommodations for INTECH '83 include the completely renovated Palmer House, the Conrad Hilton and the McCormick Inn.

REGISTER NOW!

☐ Yes! Register me for INTECH '83.
☐ Send information only: ☐ conference ☐ exposition

Conference Fees:

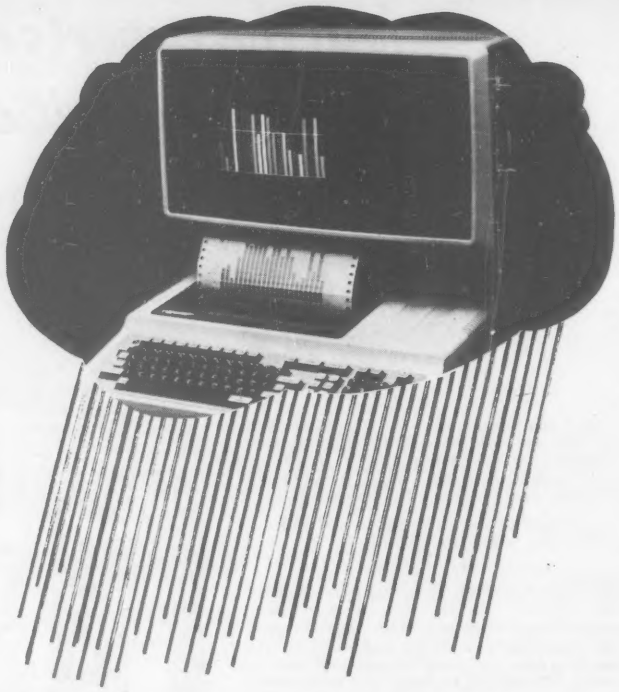
☐ Full three-day conference & exposition (after September 20 — $395.)	$360.
☐ One-day conference & exposition Circle one: Tuesday Wednesday Thursday	$195.
☐ Monday "In-Depth" Tutorial (includes lunch) Circle one session: A B C D	$295.
☐ Four days: includes three-day conference & exposition plus tutorial (after September 20 — $645.)	$595.
Total:	____

Name & Title _____
Company _____
Address _____
City, State, Zip _____
Telephone _____

☐ Check enclosed ☐ Bill Company (P.O.#)
☐ Bill me ☐ American Express
☐ MasterCard ☐ VISA/Bank Americard
Card # _____ Exp. date _____
Signature _____

Please return coupon to INTECH '83, Box 880, 375 Cochituate Road, Framingham, MA 01701

How are minis and small business systems weathering the micro storm?



Turn to *Computerworld's* September 26th Special Report and get the whole story.

How are 16-bit minis doing in a 32-bit world? How are they stacking up against the new mainframes? Against the multi-user micros? Can they survive being squeezed from both ends of the hardware spectrum? How do mini-based systems stand up against micro-based small business systems?

If these are some of the questions you're asking about minis and small business systems, then *Computerworld's* Special Report, "Minicomputers and Small Business Systems: Weathering the Micro Storm" is just what you've been waiting for. You'll get a full description of the evolution of minicomputer technology right up to state-of-the-art, and a discussion of how minicomputer manufacturers are fighting back against the price and performance offered by the manufacturers of multi-user micros.

You'll read why the 16-bit machine isn't dead — why it's still a viable product. You'll get a clear definition of the differences between minis, micros, and between minicomputer-based and microcomputer-based small business systems. You'll get a comparison between minis and the new, smaller mainframes. And, you'll get application stories and tutorials that put the whole market in perspective.

This Special Report will have articles designed to help you decide not only *what* but *how* to buy. You'll read articles that evaluate the benchmark studies out there so you can judge the tests and performance ratings for yourself.

And — to give you the complete picture — you'll get a good look at the other side of the market with a rundown of the benefits to be gained from using a multi-user micro in place of a mini.

With the ever-increasing number of systems to choose from, each day you delay in making a purchase decision means there are more systems to investigate. This September 26th Special Report is just what you need to clear up the confusion that you're faced with when deciding on the best system to meet your needs.

And if you sell to buyers of minis and small business systems, this is where you'll find your best prospects on September 26th — reading *Computerworld's* Special Report on minis and small business systems. Will the information they get be complete without news of your products? Ad close for this Special Report is September 9th.

Contact your local sales representative at one of the offices listed below or call Don Fagan, Vice President, Sales at (617) 879-0700.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Sales Offices

Boston/Chris Lee, Ed Marecki, Joe Fitzhugh, Jim McClure, Kathy Doyle, (617) 879-0700
Chicago/Art Kossack, Newt Barrett, Chris Lee, Jean Broderick, (312) 827-4433
New York/Mike Masters, Doug Cheney, Ray Corbin, Joan Daly, Fred LoSapio, Gale M. Paterno, (201) 967-1350
Atlanta/Jeffrey Melnick, Mike Masters, (404) 394-0758
San Francisco/Bill Healey, Barry Milione, Theodora Franson, A.G. Germano, Eileen Dunn (415) 421-7330
Los Angeles/Bernie Hockswender, Bob Hubbard, Beverly Raus, (714) 556-6480

Supershorts

Develcon Electronics, Inc. has established a national distributor network for its data transmission products and named John D. Roberts, formerly with Infotron Corp., as national distributor sales manager.

* * *

Data Electronics, Inc., (DEI) of San Diego, and **Tandberg Data** of Oslo, Norway, have announced an agreement in principle covering the cross-licensing and technology exchange of current and future products. Included in the agreement is the joint development of a ½-in. tape cartridge drive, based on DEI prototypes, using Tandberg Data moving-head technology.

* * *

Modular Computer Systems, Inc. has formed a government systems division and named Richard F. Moltzon general manager.

* * *

Xerox Corp. has made a $5 million grant of 1,000 computers to the National Urban League for inner-city high schools with large enrollments of black and other minority students.

* * *

Multiplications, Inc. has licensed Accolade, its CICS application development product, to General Electric Information Services Co. (Geisco). Under the agreement, Geisco will offer Accolade over its Mark 3000 service network. The license also permits Geisco to develop custom software for clients and to utilize Accolade to develop proprietary software products.

* * *

Duquesne University has purchased $1.7 million in **Sperry Corp.** computer communications equipment to supplement the university's mainframe computer. The order includes 62 Sperrylink office systems units and 36 UTS 400 terminals.

* * *

Digital Equipment Corp. and **Synercom Technology, Inc.** have announced an agreement to market cooperatively Synercom's mapping information management systems and DEC's VAX-11 32-bit superminicomputer systems.

* * *

Bolt Beranek and Newman, Inc. (BBN) has been awarded a $9 million contract by MCI Telecommunications Corp. for a private packet-switched network. BBN will supply hardware, software, engineering services and maintenance for a two-year period.

* * *

Clarkson College will supply all incoming freshmen with Zenith Data Systems Corp. Z-100 desktop computers for use during their years at the college. Upon graduation, each student will have the option of keeping the computer.

* * *

Tandem Computers, Inc. has formed a new Federal Systems Division. George Eckert has been named vice-president and general manager of the division.

Shipment Rates Of Asic Chips Seen Growing

SAN JOSE, Calif. — Shipments of application-specific integrated circuits (Asic) will grow at a compounded annual rate of 25% through 1990, exceeding $19 billion and 50% of all integrated circuit shipments by the end of the decade, according to the Semiconductor Industry Service of Dataquest, Inc.

Application-specific circuits are defined as any circuit designed or adapted to a particular user or application, Dataquest said.

According to a monthly newsletter issued by the company, the emergence of the commercial computer-aided design and electronic design automation (EDA) markets is the most significant factor leading to the rapid growth of the Asic market. The EDA market will grow faster than 65% per year over the next five years, growth driven by demand from a large number of potential end users who, until now, have not had the ability to design Asics, Dataquest said.

More information on the findings is available from Dataquest, 1290 Ridder Park Drive, San Jose, Calif. 95131.

CDC Acquires 25% Stake In Software Firm

MINNEAPOLIS — Control Data Corp. has acquired a 25% stake in Holguin and Associate, Inc., an El Paso, Texas, software company.

CDC reportedly will provide certain business, financial and management services to assist Holguin in its growth.

Holguin provides computer-aided design and drafting software and workstations for use with Hewlett-Packard Co. and Wang Laboratories, Inc. computers.

The equity venture is reportedly the first business relationship developed by the Control Data Software Co., a newly established operating division founded to establish the company as a significant software supplier.

Want User Friendly Access to VTAM Applications?

MAKE THE CONNEWS™ CONNECTION

The software product that allows 3270 users to select from an applications menu

CONNEWS is a productivity tool that supports single or multi domain networks in an ACF/VTAM environment without any systems modifications

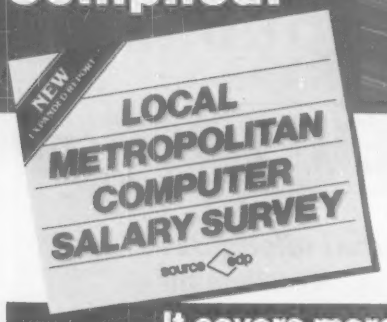
For your FREE TRIAL, call 408/725-1881

cxi An affiliate of Systems Network Analysis, Inc.

10011 N. Foothill Blvd. • Cupertino, CA 95014

POSITION ANNOUNCEMENTS

Data for Our Most Extensive Computer Salary Survey Has Been Compiled!



Call Today for Our New, FREE Mid-year Report.

It covers more positions and places!

Do you know how your salary compares with your peers? Whether computer professionals make more or less in other geographic areas. Or, now that recession is history, what economic resurgence will mean in terms of future compensation levels for computer people?

Our new, mid-year *Local Metropolitan Computer Salary Survey* – the most extensive one published to date – details salary differences in major metropolitan areas throughout the United States and Canada. It's chock-full of new statistics; some you'll find have changed substantially from past reports.

2,350 position and compensation categories.

The new Survey is based on an in-depth analysis of salaries offered by our diverse client base as well as income data provided by thousands of computer professionals we are in contact with on a regular basis.

Not only does our new report provide national median figures, it also breaks out salary data by individual market. In all, fifty position categories were surveyed in each of forty-six markets. Included are positions in programming, software marketing, software systems design, data communications, mini/micro systems, data base, computer operations, Edp auditing, computer marketing, sales, management, field service and others – at various levels of exprience and at different size computer system sites.

A useful tool for career advancement.

The Survey is compiled by Source Edp, the world's largest recruiting firm that's devoted exclusively to the computer profession.

If you're wondering where your career and income are heading, the report just might be the most valuable compensation guide you'll read and refer to often. It will not only help you evaluate your current career progress, but show you what skills are in most demand and what you can expect to earn in the future – with and without certain skill sets.

Call for your FREE report.

The new Survey is available at no charge to computer professionals. Call the Source Edp office nearest you to request a copy, without obligation. As you'll discover, there's no better way to pinpoint salary levels with more precision or to gain insight into emerging opportunities. It could be the best reading you'll do all year.

source edp
Personnel Services

The world's largest recruiting firm devoted exclusively to the computer profession.

Call today. ▶

Simply phone the Source Edp office nearest you *that's listed to the right.* A copy will be sent to you in strict confidence, without obligation. If unable to call, write:

Source Edp
Department CL-3
P.O. Box 7100
Mountain View, CA 94039

(When writing, be sure to include your title.)

United States:

Alabama	
Birmingham	205/322-8745
Arizona	
Phoenix	602/279-1010
Tucson	602/792-0375
California	
Northern:	
Mountain View	415/969-4910
Sacramento	916/446-3470
San Francisco	415/434-2410
Walnut Creek	415/945-1910
Southern:	
Fullerton/San Bernardino	714/871-6500
Irvine/Newport Beach	714/833-1730
Los Angeles/Downtown	213/688-0041
Los Angeles/South Bay	213/540-7500
Los Angeles/West	213/203-8111
San Diego	619/231-1900
San Fernando Valley	213/781-4800
Colorado	
Denver	303/773-3700
Connecticut	
Hartford	203/522-6590
Stratford	203/375-7240
District of Columbia	
Washington D.C.	202/466-5890
Florida	
Ft. Lauderdale	305/491-0145
Jacksonville	904/356-1820
Miami	305/624-3536
Georgia	
Atlanta: Downtown	404/588-9350
North	404/953-0200
Illinois	
Chicago	312/861-0770
Rolling Meadows	312/392-0244
Indiana	
Indianapolis	317/631-2900
Kansas	
Overland Park	913/888-8885
Wichita	316/688-1621
Kentucky	
Louisville	502/581-9900
Louisiana	
Baton Rouge	504/924-7183
New Orleans	504/561-6000
Maryland	
Baltimore	301/727-4050
Greenbelt	301/441-8700
Towson	301/321-7044
Massachusetts	
Boston	617/482-7613
Burlington	617/273-5160
Wellesley	617/237-3120
Michigan	
Detroit	313/259-7607
Southfield	313/352-6520
Troy	313/362-0070
Minnesota	
Minneapolis: West	612/544-3600
Downtown	612/332-6460
St. Paul	612/227-6100
Missouri	
St. Louis	314/862-3800
Kansas City	816/474-3393
New Hampshire	
Nashua	603/880-4047
New Jersey	
Cherry Hill	609/482-2600
Edison	201/494-2800
Morristown	201/267-3222
Paramus	201/845-3900
Princeton	609/452-7277
New Mexico	
Albuquerque	505/247-4270
New York	
New York City: Grand Central	212/557-8611
Penn Station	212/736-7445
Wall Street	212/962-8000
Rochester	716/263-2670
Syosset, L.I.	516/364-0900
White Plains	914/683-9300
North Carolina	
Charlotte	704/552-6577
Ohio	
Akron	216/535-1150
Cincinnati	513/769-5080
Cleveland	216/771-2070
Columbus	614/224-0660
Dayton	513/461-4660
Oklahoma	
Oklahoma City	405/722-7410
Tulsa	918/599-7700
Oregon	
Portland	503/223-6160
Pennsylvania	
King of Prussia	215/265-7250
Philadelphia	215/665-1717
Pittsburgh	412/261-6540
Tennessee	
Nashville	615/256-0625
Texas	
Austin	512/479-0720
Dallas: Central	214/954-1100
North	214/387-1600
Fort Worth	817/338-9300
Houston: Downtown	713/751-0100
Galleria	713/439-0550
San Antonio	512/342-9898
Utah	
Salt Lake City	801/966-3900
Virginia	
McLean	703/790-5610
Washington	
Seattle	206/454-6400
Wisconsin	
Milwaukee	414/277-0345
Canada:	
Ontario	
Toronto: Downtown	416/865-1125
Don Mills	416/425-5730
Mississauga	416/272-3333

IBM
(Charlotte)
SYSTEMS PROGRAMMER

Our client, IBM, requires 2 systems programmers. One should have 4 years experience in software support: IBM 370, OS/MVS/JES3. The other should have 3 years experience in micro-coding, assembler language.

Rick Young
Corporate Personnel
3705 - 310 Latrobe Drive
Charlotte, N.C. 28211

NORTH CAROLINA

If you qualify for positions in the $20,000 to $40,000 range, contact us in total confidence concerning opportunities in the Carolinas. We specialize in Data Processing professional placement. Our clients pay our fees and provide relocation assistance.

ROMAC
2000 W. First Street (-C)
Winston-Salem, North Carolina 27104
919-725-1933

CALIF. & UNIX*

Openings in a variety of areas and disciplines.
(714) 891-UNIX*
CPU COMPUTER PROFESSIONALS UNLIMITED, agency
7441 Garden Grove Blvd.
Ste. G, Garden Grove, CA 92641
*UNIX is a trademark of Bell Laboratories

IDMS/DB ADMINISTRATOR

Multi-million dollar New Jersey based electronics company needs 1-2 years experience with Cullinane's Database software. We offer great opportunity for advance, excellent benefits and working conditions. If you have experience with CV Gens, VM/CMS, CICS, DOS/VSE for logical and physical design and development please contact:

Linda Dorsey
(213) 475-2416

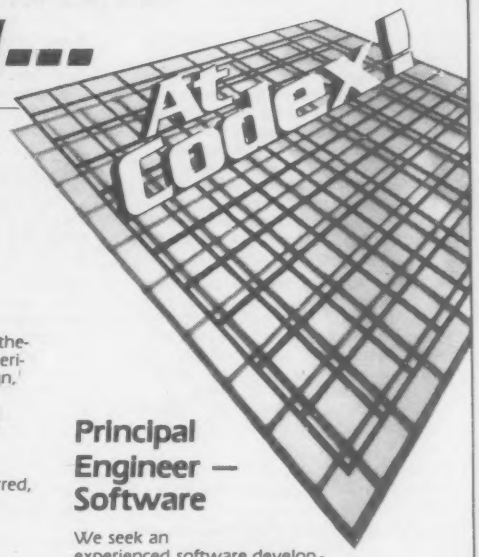
ATTENTION:
IDMS "LOVERS"

I am currently recruiting experienced IDMS P/A's, S/A's, DBA's for 8 Fortune 500 companies in NC, SC, VA, GA & FL.

Top Salaries
Benefits
Fees
Interview
Relocation Expenses Paid!

Call TODAY - A "DP PRO" -
Diane Amos, CPC
(919)584-5591
PERSONNEL PLACEMENT, INC

Connect with the Strategic Partner in Networking...



Codex is a recognized leader in the design, development, manufacture and distribution of telecommunications equipment and networks worldwide.

Our current strategy calls for massive research and development investments in new techniques, new products and new markets. And we intend to make our strategy a success, in partnership with our corporate parent Motorola...and with you. If your career plans include building on your strengths into new, promising areas, consider a strategic partnership with us! We now have many openings for engineering professionals including these:

Internal Consultant — Network Management

You will be Codex's key architect for network management products in this consultant postion. The successful candidate will have a strong systems design background, knowledge of host-oriented network architecture, Data Base Management, and Network Management. You'll also play an important role in developing efficient, "ergonomic" man/machine interfaces. **Contact Paul Johnson.**

Network Architect

As a key technical contributor in our network management division, you'll develop portions of the architecture to internetwork and manage heterogeneous networks. MSCS or equivalent required, with at least 6 years' experience including software development experience in one or more aspects of computer networking. This is a senior position for a real networking expert with imagination. **Contact Bob Lippman.**

Software Engineer

We need a Software Engineer with experience in developing or maintaining software products, to perform major enhancements of existing software products, and to test and support the enhanced products. Solid background in data communications or network control desirable; BSCS or equivalent required. A good opportunity to join an ongoing product team and make an impact. **Contact Dave Temple.**

Senior Hardware Engineer — VLSI

Codex is heavily involved in state-of-the-art VLSI technology. We seek an experienced VLSI designer to do logic design, development and testing of VLSI for future network products. You should have experience in bringing a digital design from breadboard to silicon. Microprocessor or LAN experience desirable. BSEE required, MSEE preferred, with at least 3 years' experience in LSI/VLSI. **Contact Dave Temple.**

Senior Suppport Programmer

We need a highly skilled programmer to support the entire software product development cycle at Codex, from research through manufacturing. You will design, develop, test, analyze and evaluate system programming projects, assemblers, compilers and cross software. Working closely with the user community, you'll identify problems and offer software solutions. BSCS or equivalent, with 3 years' experience.
Contact Dave Temple.

Principal Engineer — Systems Integration

Our sales, marketing and field applications effort requires strong technical support, especially for complex network management systems needing "specials" and unique applications. You'll provide technical guidance for our full spectrum of communications products. Excellent communications and presentation skills required; design engineering background a plus but not required. An excellent growth step for Customer Service Engineers, Applications Engineers, Telecomm Managers or Network Control Center Managers.
Contact Paul Johnson.

Principal Engineer — Software

We seek an experienced software development engineer to take responsibility for "ergonomic" factors of major new products, including function and design requirements for successful man/machine interfaces. You should have MSEE/CS plus 8 years' experience in software development, including data communications and user interfaces. Knowledge of M68000 and MC6809 designs, assembly language and 'C' required. **Contact Rob Noel.**

Group Leader — Software Tools

Manage the software support/tools development group. Direct development and maintenance of tools and resources for product development groups. Broad experience with the software development process and the role of software tools is essential. Line management experience is also required. A BS in Computer Science or Electrical Engineering is required. An MS is preferred. Familiarity with the issues of software quality and development productivity is important. **Contact Dave Temple.**

These positions are located at our Product Development Engineering Facility in Canton, MA. If you are interested in these positions, please send your resume and salary history to the appropriate contact person at CODEX CORPORATION, Dept. 200-808, 20 Cabot Boulevard, Mansfield, MA 02048.

plus... Our on-going record of success allows Codex to offer solid opportunities to a wide variety of computer industry professionals. If you are curious, please submit your resume, in confidence, as indicated.

codex

MOTOROLA INC.
Information Systems Group

An Equal Opportunity/Affirmative Action Employer M/F/V/H

IMMEDIATE OPENINGS FOR TOPS-20, TOPS-10, VMS, RSX, AND PRESALES/TECH SUPPORT PROFESSIONALS

SOFTWARE SUPPORT SPECIALISTS

NEW CONCEPTS IN CUSTOMER SUPPORT OPEN EXCITING CAREER PATHS IN THE ROCKIES.

Our accelerated growth in providing state-of-the-art software support has created exceptional opportunities for highly motivated, technically proficient specialists. You'll be in the forefront of computer technology as part of Digital's most advanced Customer Support Center. Staffed by teams of specialists, equipped with virtually unlimited computer resources, the Center provides software support to our customers throughout the U.S. and Canada. Join us for this unique opportunity.

We want to talk to you if you have the communications skills to consult with our customers on a one-to-one basis, the ability to work as a team member while researching and structuring innovative solutions to complex software problems, and the drive to take full advantage of the technical and managerial growth opportunities our expansion will create.

If you are interested and qualified for one of the following positions, write us soon.

TOPS-20/TOPS-10

Several positions available. Requires 1 to 5 years of operating system support experience with DECsystem-10's, DECSYSTEM-20's or other large time-sharing systems. Applications experience in several high-level languages preferred.

VMS—requires at least 2 or more years of system experience. Experience with data base products preferred.

RSX—requires at least 2 years' RSX-11M or RSX-11M-PLUS applications and/or system experience.

PRESALES/TECH SUPPORT—DIGITAL SYSTEMS—experience on at least one or more Digital operating systems or configurations.

All positions offer competitive salary/benefits package plus relocation assistance to Colorado Springs, an area with a moderate year-round climate, a reasonable cost of living, and a wide variety of recreational and cultural attractions.

To apply, please send your resume to: Eva Martinez, Digital Equipment Corporation, Customer Support Center, Dept. 0815 3804, 4405 N. Chestnut Street, Colorado Springs, Colorado 80907.

We are an affirmative action employer.

digital

MRP II PROFESSIONALS

THE COMPANY

HMS Computer Systems, Inc., provides information systems - for Manufacturing, Distribution, and Financial management - through packaged software and implementation consulting. The position of SENIOR MANUFACTURING SPECIALIST has been created to assist in our definition and development of the next generation of MRP II software; software for both management and the practitioner.

THE POSITION

As a SENIOR MANUFACTURING SPECIALIST you will use your experience, knowledge, and creativity in a variety of challenging activities. After critiquing our overall design, you will be assigned primary responsibility for the design of several systems modules. You will assist in the development of user-oriented documentation and implementation procedures. Eventual responsibilities may include consulting, ongoing product definition, sales support, and education/training/seminar activities.

YOU

If you fully understand MRP II philosophy, techniques, and management reporting requirements, we have an outstanding career opportunity for you. The ideal candidate will have had hands-on user experience in successful MRP II implementation, substantial Master Scheduling/Production Planning responsibilities, and be APICS certified. If you desire the professional challenges and rewards that this position has to offer, please submit your resume and salary history to:

HMS

HMS COMPUTER SYSTEMS, INC.
V.P. - Product Support
P.O. Box 35505
Tulsa, Oklahoma 74153

We Are An Equal Opportunity Employer M/F

SALES DIRECTOR

Exciting ground-floor opportunity for you!

We are the fastest growing, most highly regarded research and consulting firm in the information processing industry, and have just established a Custom Products Division, headquartered in the Delaware Valley — We're looking for a senior management person to head-up the effort.

This high visibility position requires at least 5 years experience in EDP sales, outstanding sales management ability, communication skills, and the ability to deal with people at the highest levels of technical and company management. We offer a compensation program commensurate with the responsibility.

If you have this background and want to head-up and build our new division, send your resume, salary history and requirements, to:

CW-B4240, Computerworld, Box 880, Framingham, MA 01701

An equal opportunity employer M/F

IMS Specialists

Let us relocate you to Southern California!

We are currently seeking experienced IMS Specialists to join us at our Orange County Headquarters. Our environment includes an IBM 3XXX MVS/XA and THE LARGEST IMS DATA BASE IN THE U.S.!

IMS Systems Analyst

Assignments will include the analysis, design and implementation of large scale IMS DB/DC Fast Path systems. Requires extensive IMS experience in a large project environment. Fast Path and Yourdan highly desirable.

IMS DBA

Responsible for all DBA tasks related to the specification, design and implementation of IBM data bases. Requires a minimum of 5 years as an IMS DBA. Fast Path experience highly desirable.

Our people enjoy a progressive environment composed of top professionals and responsive management. We offer competitive salaries, excellent company-paid benefits and full relocation! Call collect or send your resume in confidence to:

Deana St. John
TRW-ISD
505 City Parkway West,
Suite 100
Orange, CA 92668
714.937.2487

TRW

Equal Opportunity Employer

FORTRAN APPLICATION PROGRAMMERS

We are looking for **experienced** Application Programmers for our mid-west computer graphics operation. We can offer excellent salary, working conditions, opportunities for creative expression and the usual good fringe benefits.

Our selected candidates will have at least 3 years experience using his own programming skills to solve problems.

Knowledge of PDP MACRO II, VAX VMS and DBMS are helpful.

If you're ready to move on to a fast track with a rapidly expanding company, send us a resume. We'll talk it over.

Reply to CW-B4235
Computerworld
Box 880
Framingham, MA 01701

FLORIDA

We have specialized in the placement of computer professionals for over 14 years. Our staff consists of former DP managers who understand your career needs. Current openings exist at all levels in all EPD, Software Engineering, Sales Marketing disciplines. For a glimpse at the dynamic future you might qualify for the #1 growth state, contact:

COMPUTERPEOPLE

5729 N. Hoover Blvd., Suite 204
Tampa, FL 33614
(813) 885-6135

We Serve Computer Professionals Exclusively-And That's Important to YOU!

Computer Specialists

ENJOY!

THE BEAUTIFUL COAST OF MAINE.
THE SKI SLOPES OF NEW HAMPSHIRE.
THE CHARM AND TRADITION OF BOSTON

Enjoy the cozy sophistication of New England, where everything is close by...including some outstanding career opportunities.

Several well established client firms in Portland and other coastal cities are looking for Programmer/Analysts and Systems Analysts with experience on IBM 4341, 3081 or similar equipment, with expert knowledge of OS/MVS, JCL, CICS or COBOL. Also Systems Engineers with BSEE and experience with DEC VAX in CAD/CAM environment sought.

All fees, interview and relocation costs paid by client company. Send confidential letter or resume to: Sheehy Associates, Inc., Suite M, 465 Congress St., Portland, ME 04101

Representing Equal Opportunity Employers

BROWARD COUNTY, FLORIDA
Exempt
Employment Opportunity
ASSISTANT DIRECTOR INFORMATION SYSTEMS
$30,589 - $40,136

An administrative position assisting in the direction of all activities related to the development, preparation and implementation of diversified and complex computer programs and applications for the County.

Position requires graduation from an accredited four year college or university with major course work in computer science, business administration or related field and six (6) years administrative experience in systems analysis, programming and computer operations; or any equivalent combination of training and experience.

Resumes, with complete salary history, must be received not later than 5:00 P.M. September 2, 1983 by the:

Director
Information Systems Division
Room 1002, 201 S.E. 6th St.
Ft. Lauderdale, FL 33301

position announcements | position announcements | position announcements | position announcements | position announcements

DATA PROCESSING PROFESSIONALS

DATA RESOURCE CORPORATION, headquartered in Atlanta, is a leader in quality Contract Programming and Consulting. Our continued growth in the Southeast and Southwest has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design.

We are currently seeking individuals with at least 3 years of diversified programming experience, strong technical backgrounds, and who possess the desire to work in various stimulating Data Processing environments. IMS and CICS skills are of special interest, as are the abilities to travel or relocate.

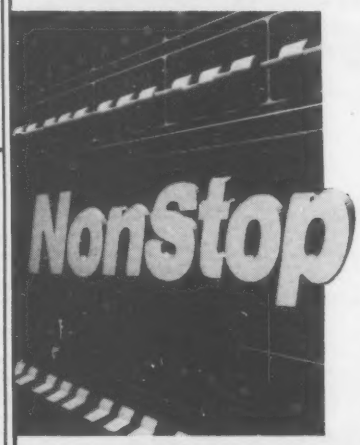
We can offer you competitive salaries and comprehensive benefits programs including bonuses and profit sharing. If you've been searching for a growth opportunity with a dynamic and progressive company with a Management team that puts people first, then DRC is your answer.

For immediate consideration, please call BECKY FINLEY at 1-800-241-6002, or send your resume to:

DRC
DATA RESOURCE CORPORATION
3301 Buckeye Rd.
Suite 103
Atlanta, GA 30341
(404) 455-7260
An EOE M/F

Imagine a company...

With a massive investment in development systems...a company that thrives on creative expression...where you work with outstanding people in your field, on one of the most ingenious on-line transaction and distributed data processing systems in the computer industry...a company where you and everyone you work with has access to extensive training programs and unique rewards...



If you could create your own place to work, we think it would be a company much like Tandem Computers.

Tandem has opportunities in the following areas:

Sales Reps
with at least 5 years progressively responsible large account mini or mainframe computer systems sales experience, including in-depth understanding of on-line transaction processing, networks and distributed data processing.

Systems Engineers
Software Technical Support Analysts with 5-10 years proven experience in the areas of design implementation, capacity planning, performance analysis, tuning and support of on-line transaction-processing systems. Specific knowledge of industry applications (Banking, Finance, Manufacturing, Retail) and/or broad experience in program languages, data bases, operating systems or data communication is a requirement.

Customer Engineers
with 3-5 years in-depth hardware systems expertise and customer support experience. You'll install, maintain, diagnose and repair system/peripherals, as well as train customer personnel. This is an opportunity to learn leading-edge systems design technology.

The Tandem benefits package is one of the most generous in the industry. In addition to paid vacation, a generous stock purchase plan, education programs and complete health and dental insurance, you can take a six week sabbatical after every four years.

If you're good at your present job in the computer industry, you'll find at Tandem there's no stopping you. Send your resume to Maureen Conway, Tandem Computers, 1827 Walden Office Square, Schaumburg, IL 60195, or call a local office. Principals only. We are an equal opportunity employer.

Tandem Computers has local offices in:

- Chicago (312) 920-1513
- Minneapolis (612) 854-5441
- St. Louis (314) 878-7180
- Tulsa (918) 663-0940
- Fort Worth (817) 870-1554
- Dallas (214) 980-0311
- Houston (713) 861-6515
- Memphis (901) 332-3777
- New Orleans (504) 831-3582
- Kansas City (913) 649-9002
- Cincinnati (513) 984-2044
- Cleveland (216) 447-0880
- Columbus (614) 895-2002
- Detroit (313) 425-4110
- Indianapolis (317) 875-8144
- Pittsburgh (412) 562-0262

...and other major cities

TANDEM
NonStop™ Computing Systems

ROBERT HALF
FLORIDA

P/A - DOS/VSE/CICS/COBOL	35K
DBA - IMS/DB/DC/CICS	32K
P/A - MVS/COBOL/CICS	25K
MGR- Sys 38/On-line	37K
DBA - HW-IDS II - DM4	29K
P/A - PICK OPER SYSTEM	24K
SYS PROG - VSE to MVS	35K
P/A - IBM/Banking/Loans	26K
Data Com Networking specialist	40K
P/A - IMS/DB/DC/Cobol	28K
P/A - DEC/DIBOL/2 Yrs	24K
P/A - SYS 34/RPG II	20K
Sr P/A - DOS/VSE/Acctg/CICS	27K

Many others to choose from. All fees and reloc. paid. Mail resume to or call collect:

STAN ALLEN
ROBERT HALF
OF TAMPA, INC.
1311 N. Westshore Blvd.
Tampa FL 33607
(813) 876-4191

HOW TO MAKE OVER $80,000.00 A YEAR ON CICS COMMAND LEVEL PROGRAMMING

Acquire one of the most demanded & rewarding programming skills in months instead of 3 to 5 years. A complete self-study book based on CICS latest version 1.5, written in COBOL and with special emphasis on VSAM. It covers virtually every CICS technique you will ever need. Sample programs address all CICS major applications and reflect the explosive changes in on-line environment.

It is hard to believe the learning can be so easy until you try it. In hours, you can start to create your own BMS maps; in days, you can start to write your own pseudo conversational CICS programs. Some CICS techniques are especially hard. When you are stuck for the technical problems, you'll be thankful you have this book.

Moonlighting on CICS projects is very rewarding. A typical 10-screen system can mean $15,000 cold cash. This book also tells you how to market your services, locate the contracts, write a proposal, make a presentation, quote the right price & draw a contract agreement without a lawyer. Sample written proposal & contract agreement are included for your convenience.

How much is this book worth to you? It is hard to say until you try it. That's why we want you to use it for 10 days; if you are not satisfied, simply return it for a full refund. See how much time it saves you, how it leads you to the gold mine of programming. That's how sure we are that once you use it, nothing could make you part with it. This book will pay for itself over and over, year after year. It is in big 8.5" x 11" size, 280 technique-packed pages.

But act now. Send $38.50 for 1, ($32. each for 2, $30. each for 3, $28. each for 4 and over) by check or money order to: CCD ONLINE SYSTEMS, INC., P.O. BOX 1170, EULESS, TX 76039. Allow 2 to 4 weeks for delivery.

NH Mass. Conn.
$25-$60K

Applications and Systems Software
Micro/Mini/Mainframe

- **Graphics**
- **Operating Systems**
- **Communications**
- **Personal Computing**
- **Business Applications**

Management Advisory Services Inc.

Colonial Office Park
48 Constitution Drive
Bedford, NH 03102
(603) 472-8844

Fees and relocation expenses company paid.

IMS Data Base Professionals

Zayre Corp., a leader in the retail industry, is presently seeking a key individual for its Corporate Technical Staff who has the background and experience to move into a sphere of challenge that will enhance your career and creativity in the world of data base design and usage.

We are a state-of-the-art leader in Data Processing. Located in Framingham, Massachusetts, just 25 minutes from downtown Boston, we are a growing company that has earned a reputation as an innovator in the American Discount Industry.

To qualify you must possess at least 4 years of experience in the design, analysis, and technical support of IMS/VS data base applications. Your duties will include IMS support in all aspects of application systems development, logical and physical DL/1 data base design and implementation, problem determination, online screen design using MFS and the use of various IMS utilities.

Our dual CPU environment (IBM 3083-J and 168-AP with MVS, TSO, VTAM, NJE, etc.) supports both our production and test IMS online systems. We have experienced rapid business and technical growth during the past few years and this same growth is anticipated for the future.

Interested?

Take a look at Zayre and what we are doing in your Profession. If you desire additional information about this position, please feel free to contact our Executive Recruiter at (617) 620-2509, between 9am and 5pm (EDT), Monday through Friday. Or if you prefer, forward your resume with salary requirements to the Manager of Executive Recruitment, Zayre Corp., Speen Street, Framingham, MA 01701. All inquiries shall be kept in utmost confidence. An equal opportunity/affirmative action employer.

*Zayre

STATE OF ARKANSAS
DEPT OF COMPUTER SERVICES

The Department of Computer Services is currently seeking qualified applicants for the following positions:

- Data Base Analyst
- Senior Systems Programmers
- Application Programmers

The Department of Computer Services is one of the largest D.P. facilities in the State of Arkansas and utilizes IBM 4341/AMDAHL 470-V6 operating under OS/MVS using primarily COBOL under IMS/CICS.

Minimum qualifications for these positions are: BS in Computer Science or Math plus from 2-4 years extensive experience as Application Programmer, Systems Programmer or Data Base Analyst in a large D.P. facility. Data Base design and administrative experience preferred.

We offer liberal fringe benefits and professional growth opportunities commensurate with ability. Job related education and/or experience may be considered as substitution for minimum qualifications.

Resume and salary requirements should be sent to:

State of Arkansas
Department of Computer Services
P. O. Box 3155
Little Rock, Ark. 72203

Equal Opportunity Employer

PROGRAMMER/ SYSTEMS ANALYST

Excellent growth opportunity with Topeka based firm requiring additional staff. Staff involved with State-of-the-Art environment including IMS DB/DC; ADF; BTS; COBOL; Panvalet; Structured Design; MVS TSO/SPF; 3081-3800 hardware. Three to Five years experience. Applicants with IMS on-line experience preferred. Excellent starting salary with expanding fringe benefit program. Please forward resume and salary requirement to Blue Cross and Blue Shield of Kansas, Personnel Director, P. O. Box 239, Topeka, Kansas 66629 or call collect (913) 295-4638.

Blue Cross Blue Shield of Kansas

An Equal Opportunity Employer M/F

Software Professionals!

Would you be interested in:

- **A company specializing in state-of-the-art systems software products?**
- **A company small enough to give you the visibility and recognition you deserve, but large enough to offer you a diversity of technical challenges?**
- **Being part of close-knit project teams working at the leading edge of operating systems development technology?**
- **Receiving a highly competitive salary and one of the best benefit packages in the computer industry?**

Some of our current openings are:

Mini/Micro Systems Programmer. Experience in "C" programming language and UNIX operating system preferred.

Software Support Specialist. Assembler language proficiency and good customer satisfaction/communication skills required. Must be capable of resolving problems and making changes and enhancements to software products.

Project Leader. Experienced in supervision of DP professionals and development and modification of system or subsystem code in the IBM DOS/VS or DOS/VSE environment.

Senior Software Programmer. Knowledge of IBM S4300/370/360 assembler language required. Must be capable of producing module/sub-module designs and then code, test and document modules.

These opportunities are available in some of the most desirable cities in the U.S.—Chicago, Dallas and our headquarters in Richmond, VA.

Give me a call at 1-800-446-9900 or send your resume to Jackie Moorer, Personnel, Nixdorf Computer Software Company, 6517 Everglades Drive, Richmond, VA 23225. Equal Opportunity Employer M/F/H

Committed to Success

Nixdorf Computer Software Company

NIXDORF COMPUTER

SALES REPRESENTATIVES
(S.F., L.A., ATLANTA & N.Y.)

HMS Computer Systems, Inc., provides packaged software, hardware and consulting services for financial, distribution and manufacturing applications. Our plans for continued growth calls for Sales Reps who will develop new customers and support installed bases in selected territories.

You will represent software for HP3000 (Hewlett-Packard) Computer Systems, and sell software solutions to existing installations, as well as turnkey hardware/software systems. A degree is required in accounting or a related area, with a track record of sales success in financial or manufacturing systems. Current knowledge of the HP3000 user base in your area would be an advantage.

If you are an experienced, highly motivated professional ready for the challenge of an aggressive marketing program and need an attractive compensation plan that liberally rewards performance, please submit your resume including income history and list of references.

HMS

HMS COMPUTER SYSTEMS, INC.
V.P. Sales & Marketing
P.O. Box 35505
Tulsa, Oklahoma 74153
(918) 494-0992

We Are An Equal Opportunity Employer M/F

MEDGAR EVERS COLLEGE
Of The City University Of New York
Seeks A Qualified Candidate For The Following Area:
Data Processing Division (Search Reopened)

Position:	Director of Data Processing/Special Assistant for College Systems
Qualifications:	Master's Degree and eight years experience in appropriate area.
Duties:	Responsibility for DP Office Management, DP personnel supervision of 5 staff members, computer hardware, user orientation, liaison relations, programming, machine reporting, development of on-line student records and administrative systems.
Salary:	Commensurate with experience and qualifications.
Availability Date:	September 1, 1983
Send Resumes To:	**Mrs. Norma Goodman, Personnel Director** **Medgar Evers College/CUNY** **1150 Carroll Street** **Brooklyn, New York 11225**

AN EQUAL OPPORTUNITY (M/F), AFFIRMATIVE ACTION EMPLOYER

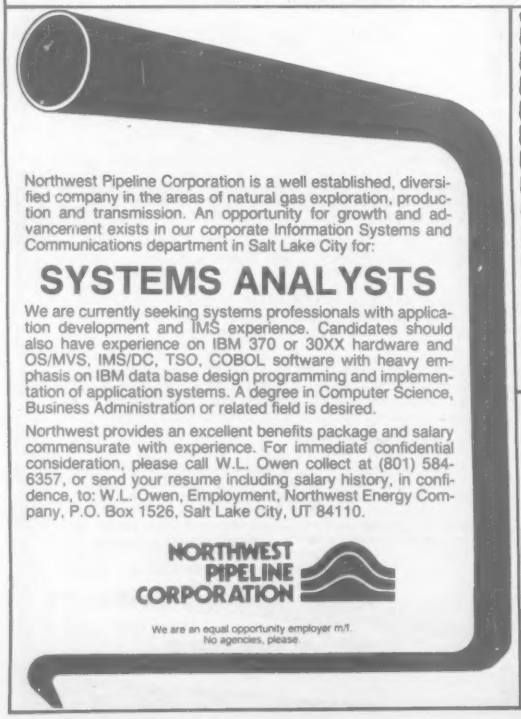
PROGRAMMER

The Regenstrief Institute, a health care research organization, needs a programmer to assume responsibility for analysis, design, development, implementation and user support in the following activities:

- an in-house data base management system,
- a clinical laboratory system,
- hospital and clinical pharmacy systems,
- an outpatient clinic system,
- a medical decision making system.

All software is written in a compiled form of BASIC for a VAX 11/780 computer. Candidates should have a BS in Computer Science, Mathematics or an equivalent technical discipline and two to five years of experience.

Salary depends upon qualifications and experience. Send resume (if possible, grade transcript) to: Ms Joanne Pox, 1001 West 10th St., Indpls., IN 46202



Northwest Pipeline Corporation is a well established, diversified company in the areas of natural gas exploration, production and transmission. An opportunity for growth and advancement exists in our corporate Information Systems and Communications department in Salt Lake City for:

SYSTEMS ANALYSTS

We are currently seeking systems professionals with application development and IMS experience. Candidates should also have experience on IBM 370 or 30XX hardware and OS/MVS, IMS/DC, TSO, COBOL software with heavy emphasis on IBM data base design programming and implementation of application systems. A degree in Computer Science, Business Administration or related field is desired.

Northwest provides an excellent benefits package and salary commensurate with experience. For immediate confidential consideration, please call W.L. Owen collect at (801) 584-6357, or send your resume including salary history, in confidence, to: W.L. Owen, Employment, Northwest Energy Company, P.O. Box 1526, Salt Lake City, UT 84110.

NORTHWEST PIPELINE CORPORATION

We are an equal opportunity employer m/f.
No agencies, please.

ANALYSTS and PROGRAMMERS

Nationwide Openings with over 1500 client companies.

- Telecommunications
- Software Dev'lt & System Progrmg
- Aerospace
- Computer Engineering
- Electronic Warfare
- Scientific & Com'l Applications

Call/Resumes to Dept C-D
(609) 771-8282
J. ROGERS ASSOC
2999 Princeton Pike
Lawrenceville, NJ 08648

SENIOR FIELD ENGINEER

FOR THE DALLAS AREA

To head a depot repair facility at a small and fast growing company. Must have minimum 3 years of chip level experience on Data General equipment and peripherals. Excellent salary and benefits. Send resume:

International Computer Remarketing
c/o Ralph Gallizzi
807 South Main
Duncanville, TX 75137

NEW ENGLAND EDP OPPORTUNITIES

Outstanding opportunities exist in New England for Project Leaders, Systems Programmers, Systems Analysts, Programmer Analysts, Software Engineers with two plus years experience.
Experience 'quality of life' while achieving your career goals. Call or write today in total confidence:

KUEBLER ASSOCIATES

Data Processing Division
Executive Office Center
Two Monument Square
Portland, ME 04101
(207) 774-9100

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

Dunhill

Of CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Caroline 28226
800-438-2012
(NC Call)
(704) 542-0312

Researching all your options will show you that your best source is COMPUTERWORLD

IMS Systems Programmers

Work on one of the world's largest private on-line networks.

Texas Instruments has immediate openings for senior and intermediate level software professionals in Dallas. Working with our Information Systems and Services Group, you'll be involved in the support of our IMS systems worldwide.

Professional Requirements These positions require a thorough knowledge of IMS internals. Experience in several of the following is preferred: System definitions, SMP, VSAM, VTAM, MSC, XA, CICS, and FAST PATH. Background must also include assembly language programming for IBM mainframe.

Excellent Benefits We'll compensate you for your talents with an excellent salary and comprehensive benefits package. Plus you'll like the endless opportunity for advancement you'll have at TI.

Great Lifestyle You'll like living in Dallas, where recreational and cultural activities abound. Sailing, waterskiing, shopping. Museums and theatre. Major league sports. You'll find everything right here in Dallas. Everything, that is, except city and state income taxes.

Apply Today For more information about our immediate openings, call Paul Patak toll-free at 1-800-255-9204. In Texas call 214/343-7951. Or send your resume in complete confidence to: Paul Patak/Texas Instruments/P.O. Box 225621, M.S. 3609/Dallas, Texas 75265.

An Equal Opportunity Employer M/F.

TEXAS INSTRUMENTS

Creating useful products and services for you.

Technical Field Support Specialists

Human Resource Applications

Genesys Software Systems, a recognized leader in state-of-the-art Human Resource Management Systems, has ground floor opportunities for Technical Field Support Specialists in **Orlando and New York City.** These are new positions, offering advancement to Regional Support Managers, as we expand our field support organization from our corporate headquarters to our regional offices.

You will be establishing a new field support group responsible for sales and installation support and customer training and consultation. The individuals we seek must be **experienced** Systems Analysts knowledgeable in the HRMS applications software areas of Payroll, Personnel and Benefits. Familiarity with JCL, COBOL and IBM OS and DOS operating systems is required: CICS or IMS background would be a plus. Travel is required.

Genesys' continued rapid growth will soon be creating additional opportunities for Field Support Specialists and Sales Representatives in other major U.S. cities. (Sales opportunities are immediately available in Houston and Chicago.) Interested individuals are invited to reply at this time.

If you would thrive in a fast-paced, professional environment and enjoy the technical challenges of a company that introduced the Second Revolution in HRMS, please forward resume and salary information to Cathy Bocek, Personnel, Genesys Software Systems, Inc., 10 Grafton Street, Lawrence, MA 01843.

Genesys
SOFTWARE SYSTEMS, INC.
TEN GRAFTON STREET
LAWRENCE, MASSACHUSETTS 01843

an equal opportunity employer

SOFTWARE ENGINEERS! DISCOVER PROFESSIONAL GROWTH OPPORTUNITIES WITH XEROX.

Xerox Corporation's Office Products Division, a leader in office automation, has several outstanding opportunities for Software Engineers in our Dallas, Texas facility. Qualified applicants must have the following general credentials:

- **8-10 years product development experience with recent experience on Mini/Micro computers with office automation software.**
- **Must have experience with Assembler Language and either PASCAL or C.**
- **A BS or MS in Computer Science is highly desirable.**

The specific job opportunities are in the area of:

WORK STATION SOFTWARE DEVELOPMENT

SYSTEMS DESIGN - Must be capable of creating and maintaining software specifications, making tradeoff analysis, and resolving architectual issues.

OPERATING SYSTEMS - Must have experience with developing system software, preferably with one of the popular microcomputer operating systems.

APPLICATIONS - Must have experience with at least one of the following types of packages: Word Processing, Business Graphics, Spreadsheets, Calendars, Records Processing, or Project Management.

COMMUNICATIONS - Must have protocol development experience in the areas of 2770/2780/3780. Ethernet experience and familiarity with networking applications software is desirable.

PROGRAMMING ENVIRONMENT

SYSTEMS - Must have experience with supporting VAX or DECSYSTEM software.

TOOLS - Must be capable of supporting cross-tools for microprocessor development, including assemblers, compilers, linkers and debuggers.

SOFTWARE ACQUISITION

MANAGER - Must have management experience in acquiring 3rd party software. Knowledge of licensing, royalties, specifications, and acceptance procedures is required.

ACQUISITION ENGINEER - Must have experience with evaluating vendor software, managing vendor interfaces, and specifying software acquisition procedures.

SIMULATIONS SOFTWARE

SIMULATIONS SYSTEMS - Must be capable of understanding and maintaining a Smalltalk compiler.

SIMULATION APPLICATIONS - Prefer experience with using LISP or Smalltalk languages for modeling operator interfaces.

These positions in the simulation area require up to 6 months of training in California.

Xerox will be interviewing at the end of this month for these challenging positions. Qualified and interested candidates who want to take advantage of Xerox's excellent salary and benefit program, should act immediately. Send your resume to: Employment, Xerox Corporation, Office Products Division, MS 180, Dept. CW-815, 1341 W. Mockingbird Lane, Dallas, Texas 75247. Xerox is an affirmative action employer.

XEROX

DALLAS

HIGH TECH-MINI'S

NYSE co. staffing for long range (15 yr.) project. Strong programming bkgrnd in 32 bit MINI world (TANDEM a plus). BS required; stability, future growth, excellent benefits are hallmarks of this firm. Full interview, relo & fee paid by co; To $40K.

2720 Stemmons Frwy. 1207F
Dallas, TX 75207 (214) 637-6360

DATA PROCESSING CAREERS

Senior Programmer/Analyst

Rapidly growing medical data processing firm requires a Lead Programmer/Analyst with at least 5 years in RSTS-E/VMS environment. Send resume or call:

Robert A. Reid, M.D., President
Commonwealth Clinical Systems, Inc.
405 Water St.
Charlottesville, VA 22901
(804) 977-1867

ARDICO - BURROUGHS

Distributors for Saudi Arabia

Requires to Support its expansion program

Marketing Executives

in addition to Professional Challenges, we offer:

- Excellent Salary (Tax exempt)
- Car
- Fringe Benefits
- Housing
- Annual Home Leave
- Paid Air Fare
- Medical Coverage
- Advancement Opportunities

Univ. Graduate min (5) five years experience in marketing. Position open immediately. For consideration Please send resume and credentials to:

ARDICO-Burroughs
P.O. Box 6087
Riyadh, Saudi Arabia

position announcements | position announcements | position announcements | position announcements | position announcements

MARKETING REPRESENTATIVES- SOFTWARE

As a result of sustained profitability and a recently completed public stock offering, Infodata Systems is poised and financed for aggressive, rapid growth.

Our INQUIRE Information Resource Management System uniquely integrates 4th generation language, relational database management, and text/document management into a single software product for the IBM MVS, VS1, or VM/CMS environments. INQUIRE is in use every day at hundreds of corporations, worldwide.

Our marketing representatives require at least two years of successful experience selling "big ticket" products to large corporations, a technical applications background in the IBM mainframe environment, and a Bachelor's degree or equivalent experience.

In addition, you must be a self-starter who can work independently in a highly organized fashion. A strong professional image is a must.

Infodata offers a generous compensation plan consisting of salary plus commissions, no ceiling on earnings, and comprehensive benefits including stock options.

We have openings in major U.S. cities. If you meet the qualifications, and are ready to join a fast-paced, growing software products company, then send your resume with compensation history.

Infodata®
INFODATA SYSTEMS INC

5205 Leesburg Pike, Dept. MR
Falls Church, VA 22041
(703) 578-3430

Equal Opportunity Affirmative Action Employer

DENVER POSITIONS

Data Processing services organization located in the southeast metropolitan Denver area has openings for:

- Systems Programmers - Opportunities for persons with two or more years software internals experience with MVS, IMS, CICS, or IDMS DB/DC.
- Software Engineering - Group level position in development of fault tolerant software for multi-micro-processor based fail-safe systems.
- Systems Engineers - Hardware/software specification and integration of large scale computer systems. U.S. citizenship required, recent DOD experience preferred. Positions available in Denver and East and West Coastal areas.

Persons qualified for any of the above positions are invited to send a resume and salary requirements in complete confidence to:

Employment Manager
P.O. Box 441171
Aurora, CO 80044

EOE M/F/V/H

We regret that we are not able to accept agency referrals.

CICS PROGRAMMER

The Philadelphia Electric Company has an immediate opening for a programmer for the development, enhancement and maintenance of the company's Primary Accounts Communication System.

This system is being developed for an IBM 3083 computer using OS/MVS/CICS CAPEX, PANVALET, TSO/SPF software.

The candidate must have 2 to 4 years experience with the design, programming and implementation of on-line computer systems, including two years in Command-level CICS/VS and ANSI COBOL programming and one year's experience utilizing Assembler Language. A knowledge of teleprocessing software and hardware is advantageous.

Applicants should submit resume and salary history to:

Employment Division
2301 Market Street, N1-1
Philadelphia, PA 19101

Philadelphia Electric Company

An equal opportunity employer

PROGRAMMER/ ANALYSTS

COBOL, ASSEMBLER, MARK IV
IMS DB/DC CICS

Join one of the nation's leading DP consulting firms. We are currently staffing long term contracts thruout the Midwest. We offer above average compensation and the opportunity to work in State of The Art shops. ANALYSTS to design a wide variety of business and manufacturing systems utilizing large IBM mainframes with a variety of software including CICS and IMB. PROGRAMMER/ANALYSTS to create and implement customized business and manufacturing systems using COBOL, ASSEMBLER, MARK IV, CICS and IMS.

(SUB CONTRACTORS WELCOME)

If you have the skills and want to earn top $$,

CALL (800) 543-7583
In Ohio, call (513) 890-1200

ALLEN SERVICES COMPANY Div. of
CGA COMPUTER ASSOCIATES
212 W. NATIONAL RD.
VANDALIA, OHIO 45377

MARKETING MANAGER FEDERAL GOVERNMENT SALES

INSLAW, INC., a leading ventor of application software packages to the public sector, is seeking a federal government Marketing Manager to join its rapidly expanding marketing and sales force. This manager will market Inslaw's packages for installation on in-house computers and will market the packages via Inslaw's timesharing service.

Candidates must have a minimum of 5 years of experience in computer products/services sales to federal, civilian, and defence agencies. Interested principals should direct resumes to Ms. Davis. We offer an outstanding benefits package and an attractive salary plus commission plan.

INSLAW INC.
1125-15th Street N.W., Suite 600
Washington, DC 20005
EOE

EDP Consultant Direct Marketing

Leading direct marketing consulting firm is adding to staff. We seek an individual with strong mail order, publishing, and order processing, clerical and computer systems background.

The person must be able to communicate very effectively both in person and in written material. New York metropolitan area resident preferred.

This is an outstanding opportunity with a fine benefit package and limited travel.

Please send resume and salary requirements to:

Chairman
Fenvessey & Schwab, Inc.
645 Madison Avenue
New York, NY 10022.

DEPUTY DIRECTOR OF ACADEMIC COMPUTING INDIANA UNIVERSITY BLOOMINGTON

Direct the activities of Bloomington Academic Computing Services, including all aspects of computing services delivery, data communications, computer operations, software support, user equipment acquisition, and user education. Monitor, evaluate, and recommend revision of systems to improve service or resource utilization. Develop and approve operating plans for the organization to ensure proper distribution of tasks. Work closely with Dean and faculty to guide long term direction of Academic Computing at IUB.

Masters degree as well as at least 7 years work experience in the area of computing, preferably in a university, is required. A terminal degree is preferred but not required. Candidates must have at least 5 years experience in managing a major functional area within a computing center (preferably at a university) and be able to demonstrate a high level of energy and interpersonal communication skills. Please submit application and vitae by September 15, 1983 to:

Professor Daniel W. DeHayes
Dean and Director
Academic Computing
Indiana University
Bryan Hall 007
Bloomington, IN 47405
An Affirmative Action
Equal Opportunity Employer

COMPUTER PROGRAMMING, SYSTEMS AND ENGINEERING PROFESSIONALS

National employment resources at your service. Through our screened and selected employment affiliates, we'll get your resume to employers with applicable job openings in your targeted geographic areas. Openings for systems software and all kinds of applications programmers and analysts, EDP marketing and support reps, hardware and software engineers, EDP technical writers, etc. A quick and easy way to cover the job market. No fee, contract or obligation.

At least one year of professional experience required. U.S. citizens and permanent residents only. Send one resume along with current and desired salary, desired location and a summary of your computer hardware and software experience to:

NATIONAL CONTACT NETWORK, INC.
Ref. CW, 3100 West Chapel Avenue
Cherry Hill, N.J. 08002 / (609) 667-4080

PAYROLL/PERSONNEL SYSTEMS EXPERIENCE

Experienced professionals with knowledge of one or more commercial Human Resource System packages are needed. Of special interest are the packages marketed by: MSA, ISI, PDS, Westinghouse, INSCI, and McCormack & Dodge. Knowledge of other financial applications is a plus. Our firm offers a full range of consulting services to clients. We have offices on both coasts with immediate consultant opportunities in several locations. Compensation package is excellent. Send resume describing experience to:

Business Information Technology, Inc.
P.O. BOX 8213 • NEWARK, DELAWARE 19711
P.O. BOX 83 • CONCORD, CA 94522

HIRING?

More computer people read Computerworld than any other newspaper in the United States - more than half a million computer people every week. And, among our 529,650 readers at user organizations about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads). No wonder Computerworld carries more recruitment ads for computer people than any other publication. To place your ad or to get a rate card with complete details on Computerworld Classifieds, call or write:

Classified Advertising
Computerworld
Box 880
Framingham, MA 01701

617-879-0700
1-800-343-6474

FIELD ENGINEERS

Dataserv Computer Maintenance is expanding nationwide. We now have immediate openings in major cities and will be adding more in the near future.

These are key positions and provide excellent opportunities that will lead to further promotion in a fast growing company. Excellent compensation plan and good fringe benefits for experienced individuals. Your potential for personal advancement with a $100 million plus company is the greatest right now as we expand.

We now have immediate openings in these cities for these positions:

Washington D.C. — FIELD ENGINEERS
We need experienced F/E to maintain IBM 327X display equipment.

Milwaukee, Wisconsin — FIELD ENGINEERS
Immediate opening for engineer with experience on IBM tapes, printers, disks, display equipment.

Dallas, Texas — FIELD ENGINEERS
Excellent position for experienced Field Engineer to work on IBM 327X equipment. We have several openings in the Dallas, Ft. Worth metro area.

Los Angeles, California — FIELD ENGINEERS
Field Engineers required for the support of IBM 3600 Banking and/or Supermarket Systems.

Series 1 — FIELD ENGINEERS
Immediate openings — Minneapolis/St. Paul. Other cities nationwide in the very near future.

Dataserv will soon have additional opportunities for field engineers and technical specialists in several other major cities throughout the United States. If you are considering a change in employment, contact Dataserv for a review of what we have to offer.

For immediate consideration and more information call **Toll Free — 800-328-6729** or send your resume to: **Bev Walters, Dataserv Computer Maintenance, Inc., P.O. Box 3003, Hopkins, MN 55343.** We are an equal opportunity employer and all inquiries are considered confidential.

dataserv

Move Up With Amdahl

Amdahl Communications Systems Division designs and manufactures state-of-the-art digital data communications networks. Our projects are stimulating, our pace accelerating and our outlook excellent. We seek experienced professionals in order to maintain our lead as innovators in Digital Communications.

Technical Services Manager
Software
As Technical Services Manager you will handle matters of interdepartmental coordination, issue engineering schedules to Marketing and Manufacturing, serve as engineering's interface to other departments, and manage a trouble reporting system. You will provide technical support to Marketing on field problems and correct software errors, as well as maintain customer files on installed software and hardware.

Required are 6-8 years of software development and support experience, including 3-5 years as a manager. You must have knowledge of scheduling techniques, data communications protocols (X.25 preferred) and network concepts. Also vital are good communication, coordination, leadership and training skills.

Sr. Software Engineers
Technical Services
We have 3 openings for Sr. Software Engineers to provide technical leadership roles in support of network concentrator products. You will investigate and correct software problems with communications protocols and network control. You will also provide technical assistance to sales, publications, training and field support personnel.

3-5 years experience in software development or support is required. Background in the following: communication protocols, realtime software, X.25, Assembly language, and PASCAL is needed. Microprocessor experience preferred. BSCS/BSEE required.

Senior Systems Programmer
The selected candidate will implement and maintain software development facilities and tools running under UNIX. Other duties include implementing and maintaining communications facilities.

5-7 years systems experience is required for this position. Knowledge of UNIX, PASCAL and UNIX software development and maintenance aids (SCCS and MAKE) is desirable.

We offer an outstanding salary/benefits package including company-paid insurance, stock purchase and savings plans. For immediate confidential consideration, send your resume and salary history to: **J. Keller** or call **(800) 421-2331.**

From California call (213) 822-3202.

Dept. CW 8/15
2500 Walnut Avenue
Marina del Rey, CA 90291

Equal Opportunity Employer

amdahl COMMUNICATIONS SYSTEMS DIVISION

Microprocessor Programmer

A chance to work on showcase communications and distributed processing system capabilities.

When a $3.5 billion computer company develops an own-use system it doesn't stint on costs or talent. This is what makes NCR's Information System and Services Support Group in Dayton so strategic for people who want almost unlimited resources and prospects for recognition.

The environment supported is NCR's nationwide sales and marketing organization. The very small project team you'll be joining will support microprocessor systems used in personal computers/work stations linked by a large communications network.

Your job? Writing, testing and supporting microprocessor software. You will be using our new Tower computer system. Your qualifications should include BSCS or related degree, knowledge of Basic, and at least one year of C language microprocessor programming experience. Experience with Motorola 68000 microprocessor and VERSA DOS capabilities are assets.

For prompt consideration and briefing if qualified, please send resume and salary history to: Mr. Randy Neises, NCR Corporation, Dept. 55U, USDPG, USG-1, Dayton, Ohio 45479.

NCR
Complete Computer Systems
An equal opportunity employer

SYSTEMS ANALYST
Rapidly expanding area! Must have 3+ yrs. systems programming in "C"; communication protocols &/or ATM bkgd a +. Excellent compensation pkg! $26-32K

FEE PAID (513) 224-0600

ROBERT HALF OF DAYTON, INC.
P.O. Box 754 MidCity Station
Dayton, Ohio 45402
Lic. DAPC Member

MVS SYSTEMS PROGRAMMER
Cedars-Sinai Medical Center, the West's premiere medical center, seeks an experienced MVS Systems Programmer with in-depth knowledge of MVS/SP, JES2, CICS, ACF/VTAM/NCP, SMP4 and RACF. Must be capable of installation, tuning, and maintenance of MVS/SP and system components. Experience with operation system conversions and capacity analysis a definite plus. Salary is in the low to mid 40's, and supported by a superior benefits package including three weeks vacation the first year. Submit resume to:
Mr. John Gilbert, Employment
C S M C
8723 Alden Dr.
Los Angeles, Calif. 90048
(213) 855-5529

BANKING DATA PROCESSING

BANK ONE, one of the nation's most aggressive and progressive financial institutions is searching for Data Processing Professionals. Rapid growth due to new product development and technological advances directed toward national marketing has created several professional needs in Banking and Financial Systems.

Professionals with experience in the following areas are needed: ATM and Delivery Systems, Loan and Lease Systems, VISA Systems, Financial Products, Check Processing, Online Collection Systems, Deposit Systems, and Systems Programming.

We are on the leading edge of technological Banking Systems and have outstanding opportunities for qualified professionals. Please call or write in strictest confidence to:

BANK ONE.

Jim Harrison
BANK ONE, COLUMBUS, NA
BANK ONE Center
Columbus, OH 43271-0022
(614) 995-4096

"An Equal Opportunity Employer"

position announcements | position announcements | position announcements | position announcements | position announcements

FIND YOUR FUTURE IN PHOENIX

As one of the fastest growing cities in America, Phoenix boasts excellent schools, top cultural attractions, professional sports and easy access to outdoor recreation.

And at Arizona Public Service Company, we talk careers. As the state's largest utility supplier, we offer excellent career potential in the following positions:

SYSTEMS / PROGRAMMER ANALYST
You must possess a minimum of 2 to 4 years experience in real-time software development and process control. FORTRAN and ASSEMBLY knowledge is required for one or more of the following: CDC Cyber 18/20, MODCOMP Classic, Honeywell 4500/L-6, SEL 55/75 and DEC 11 Series computers. Experience in a power generation plant would be helpful.

COMPUTER TECHNICIANS
Requirements include a minimum of 2 years experience including chip level repair on one or more of the following systems: SEL 32/55, MODCOMP Classic, Honeywell L-6, and 4500, CDC 18/20, and PDP/11 Series.

In addition to unlimited growth opportunity we are highly competitive in salaries and benefits. To find your future, take the first step by sending your resume to:

Mr. Charles Kilzer
ARIZONA PUBLIC SERVICE COMPANY
P.O. Box 21666
Station 6262, CWO 0815
Phoenix, Arizona 85036

APS.

An Equal Opportunity Employer

SYSTEMS PROGRAMMER

Florida Opportunity!

AUXCO, a progressive software proprietor in the telephone communications industry, seeks a "professional" with the following skills:

Installation, maintenance and support of OS/MVS SP 1.3, JES II, TSO/ISPF/PDF, VSAM, IMS DB/DC and Data dictionary using SMP 4. Performance tuning and capacity planning in a multi-CPU shared DASD environment incorporating a 4341 and 3083 with 3375's and 3380's.

For consideration send resume to:
JAN ACKERMAN

AUXCO Auxton Computer Enterprises, Inc.

201 East Pine St., Suite 210, Orlando, Florida 32801

an equal opportunity employer

DATA PROCESSING PROFESSIONALS

McLEAN TRUCKING CO., a leader in trucking transportation offers excellent benefits and growth opportunities at its Winston-Salem, North Carolina headquarters. We are seeking Systems Analyst Applications Programmers and a Tech Support Data Base Specialist for expansion in major new data base systems.

SYSTEMS ANALYST AND APPLICATIONS PROGRAMMERS- Candidates must have degree and a minimum of 4 years experience with IBM 370, 3033 and/or 3081. Knowledge of IBM/MVS, CICS/VS, IMS Data Base, VSAM, COBOL, TSO, JCL, and some BAL preferred.

TECH SUPPORT DATA BASE SPECIALIST- Candidates must have degree and IMS/DB, CICS experience in installation and maintenance of data base products including data dictionary under MVS. Experience in physical and logical data base design is required.

Send resume giving salary requirements in confidence, to:

J. Weatherly
Personnel Department

McLEAN TRUCKING COMPANY

P.O. Box 213, Winston-Salem, N.C. 27154
(919) 721-2057

An Equal Opportunity Employer M/F

Systems Analyst Programmer

(San Francisco Bay Area)

Excellent opportunity for a qualified individual to analyze, design and implement hospital systems. Four years' hospital computer systems experience, as well as COBOL and HONEYWELL GCOS6 experience desired.

Excellent salary and benefits. Please submit a resume to: 545 Mission Street, Dept. KC , San Francisco, CA 94105.
Equal Opportunity Employer.

CONSULTANTS

Systems and Programming background for these and other positions:

- IMS DB/DC
- CICS (CMD & MACRO), DMS
- BURROUGHS FORTE II
- NATURAL ADABAS
- LIFECOM, UNIVERSAL LIFE
- INSURANCE EXPERIENCE
- RAPID

Systemetrix Associates is expanding its consulting staff with various permanent positions for technically competent client-oriented individuals. Consulting assignments for independent consultants are also available. Send resume to:

Mr. A.J. Carmel
Systemetrix, Assoc.
2260 B Northwest Pky.
Marietta, GA 30067
404-952-0897

Univ. of Nevada, Las Vegas Dept. of Mathematical Sciences

We have two positions available in Computer Science. RANK AND SALARY NEGOTIABLE with position starting September 1983. A MS in Computer Science or closely related field with experience in Computer Science is required. A Ph.D. is preferred. Prefer interest in computer architecture, microprocessor technology, distributed systems, database systems, operating systems, programming languages, or graphics: To teach undergraduate courses, participate in M.S. program, and do research in Computer Science. Send letter of application, resume, transcripts, and name and addresses of four references to:

Professor Evangelos Yfantis
Search Committe
Dept. of Mathematical Sciences
Univ. of Nevada, Las Vegas
Las Vegas, NV 89154

Review of applications will begin August 15, 1983 and will continue until the position is filled.

The Univ. of Nevada, Las Vegas IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER.

Halbrecht & Company has been retained to locate and fill two key positions with this major east coast company. Position openings are for:

Project Manager

Experience in applications/systems development, who can oversee and manage multiple projects (financial, material control, sales, etc.), understand systems design methodology, is a true leader and can project that image to subordinates. Degree required, M.B.A. is a plus.

Statistical Analyst

Will provide support for user services and the information center. Experience required in statistical analysis, programming (SAS) and modeling (cost projections, transportation, sales analysis, etc.). Advanced degree in Statistics or Operation Research desired.

The company offers excellent visibility, superb geographical location and setting, comprehensive benefits package including liberal relocation and salary plus bonus plan. Forward resume in confidence to:

Thomas Maltby

Halbrecht & Company

7927 Jones Branch Drive
Suite 400
McLean, VA 22102
(703) 442-8188

OS/MVS SYS. PROG.

Growth minded fin'l svc. org. seeks tech. astute internals pro. for major upgrades. Bkgrd. in IBM OS/MVS, IMS DB/DC with extensive networking. Career oppty. for the detail-oriented performer. $36,000.

Robert Half of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200
Personnel Consultants

Systems Programmer

We are a medium sized manufacturer with a challenging position for an aggressive Systems Programmer. The individual we are seeking must have experience in generation and maintenance of either DOS/VSE or VM/SP. Knowledge of RSCS, VSAM, CICS, or Data Base is a plus.

Ours is a state-of-the-art environment including an IBM 4341 running VM/SP, CMS, TMS (codasyl-type data base), DOS/VSE, VSAM, CICS, COBOL, and PL/1. We have on-line, 48 CRTs, 6 printers, and 2 BTAM teleprocessing lines.

We are located in a small, family-oriented college community in north central Ohio, and offer a good compensation and relocation package.

Please send your resume in confidence to

Don Cast, Director, MIS & DP, F.E. Myers Co., 400 Orange St., Ashland, OH 44805.

Equal Opportunity Employer M/F/H

ATTENTION APPLICATION DEVELOPMENT PROFESSIONALS

Are you challenged by your current working environment? If not, there is an abundance of opportunity and challenge in Baltimore, MD; Central PA; Washington, D.C.; Philadelphia, PA; Wilmington, DE; and Seattle, WA.

Comp-u-Staff is seeking to hire experienced analyst/programmers to work in Fortune 1000 client accounts. Comp-u-Staff is a growing, professional services company that offers high salaries, performance bonuses, excellent benefits, expense accounts and training programs.

If you would like to relocate and have four or more years development experience using:

IMS (DB/DC) CICS (DL1)

Call or send a resume to:

Comp·u·Staff®
Attn: RECRUITMENT DEPARTMENT
1 INVESTMENT PLACE, BOX C20 TOWSON, MD 21204
(301) 828-0788
We are not an employment agency

DIRECTOR M.I.S. 55K

Experience required with IBM 370 mainframe installation for Los Angeles company. Mail your resume to:

Accountants Unlimited
10920 Wilshire Blvd., Ste. 800
W. Los Angeles, CA 90024

LOOKING?

Find the job you want in Computerworld's classifieds. No other publication carries as many ads for computer professionals as Computerworld, so no other publication can give you as wide a choice of jobs, salary and location as Computerworld.You can even try a "Position Wanted" ad to look for exactly what you want, where you want.

Be sure you look over our recruitment ads every week, so you don't miss the opportunity that's just right for you.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
375 Cochituate Road, Framingham, MA 01701 / (617) 879-0700

EMPLOYMENT OPPORTUNITIES IN SAUDI ARABIA FOR

EDP PROGRAMMERS / ANALYSTS

The Vinnell Corporation, as a prime contractor to the Department of the Army to modernize the Saudi Arabian National Guard, is offering exciting and challenging positions in the Electronic Data Processing field in Riyadh, Saudi Arabia. We have immediate requirements for personnel who can qualify for the following positions:

- Supervisor, Operations Branch +
- Supervisor, Systems and Programming Branch
- Application Programmer
- Programmer / Analyst
- System Analyst / QC
- Training Data Programmer
- Trainer / Advisor EDP + +

+ Programmer Experience not required.
+ + Prior military personnel preferred.

Bachelor's degree in computer science or related area and a minimum of three to five years experience is required. Additionally, for positions requiring programming background, at least two years or must have been spent in the programming field.

ALL TOURS ARE SINGLE STATUS

Please send resumes (include all software languages in which you are proficient) and supporting documents immediately to: Vinnell Corporation / SANG-DSO, 10530 Rosehaven Street / Suite 100, Fairfax, VA. 22030. Dept: CW

VINNELL CORPORATION

The Vinnell Corporation is an Equal Opportunity Employer M/F/H/V.

NIPSSA

WE ARE INFORMATION SYSTEMS

At the
Naval Intelligence
Processing System Support Activity

INFORMATION is our **ONLY** business.

A major expansion of our capabilities has created exciting new opportunities for information systems professionals interested in new and creative systems technologies in the areas of:

- **Local Area Networking**
- **Relational Data Base**
- **Microcomputer Software**
- **Signal Processing**
- **Office Automation**
- **Computer Security**
- **Distributed Processing**
- **Image Processing**
- **Software Engineering**
- **Automated Message Handling**

We are currently seeking individuals at all experience levels. If you have a Bachelors or Masters degree in the computer field and a solid record of performance in the development or management of these or similar systems, we can offer you a significant and unique opportunity for career enhancement. If you are a recent college graduate with a degree in a computer-related field and a good academic record, we can provide unparalleled opportunities for professional development and education.

Your career at NIPSSA will provide you with hands-on challenges involving IBM MVS, IDMS, VAX/VMS, VAX/UNIX, PDP-11/RSX-11, ORACLE RDBMS, CDC NOS(BE), System 2000, and Zilog Z80 (CP/M) based systems work.

To begin your challenging new career in intelligence information processing, please send an SF 171 or resume to reach the following address by 30 August 1983:

Naval Intelligence Processing System Support Activity
ATTN: ADMIN/PERS.DIV.
4600 Silver Hill Road
Washington, D.C. 20389

A background investigation for security clearance purposes is a requirement of employment.

U.S. Citizenship required. An Equal Opportunity Employer.

"Our project backlog at this moment is the highest in our history. Despite an unsettled economic scenario, Computer Horizons has the marketing strategies, cash flow, and top-calibre team of specialists to exceed its own pattern of success."

John J. Cassese
Chairman & President

SHARE THE SUCCESS

Computer Horizons is distinguished as one of the top data processing service organizations in the nation. Our strategic growth has proven strong and sound enough to withstand any economic climate and we see this as a reflection of our sophisticated technology and the talented professionals who comprise the Computer Horizons Corporation's task force.

Our market expansion is underscored with blue-chip Fortune 500 companies in vital industries ranging from communications, banking, and finance to energy, health care, transportation and manufacturing. This has created immediate permanent or temporary positions in:

- **New York**
- **New Jersey**
- **San Francisco**
- **Chicago**
- **Miami**
- **Orlando**
- **Tampa**
- **Houston**
- **Washington, D.C.**
- **Delaware**
- **Philadelphia**
- **Kansas City**

and Connecticut...

...for success-oriented Project Leaders, Analysts, Sr. Programmer Analysts, Programmer Analysts and Programmers.

The dynamic, articulate professionals we seek will have the presence and superior communication skills to interface effectively with client management. A technical background in one of the following is required.

- **CPCS**
- **OS COBOL**
- **Honeywell Level 6**
- **ACP**
- **IMS**
- **Series I**
- **IBM PC**
- **CICS**
- **IDMS**
- **RAMIS**
- **PL/1**
- **Focus**
- **UNIX**
- **BAL**
- **SNA**
- **Burroughs**
- **M68000**
- **Datapoint**
- **OS Internals**
- **Model 204**
- **DSL**
- **Hogan Packages**
- **MSA Packages**
- **Tandem**

As a Computer Horizons consultant, you'll be rewarded with an above average salary and comprehensive benefits including major medical, dental and life insurance, deferred income savings plan and our intensive, in-house educational training program to keep you at the top of your profession.

Qualified professionals are invited to respond in confidence by calling or submitting a resume and salary history to:

Mr. Bob Palmieri, Assistant Vice President
(800) 847-4097 (in New York State, call (212) 371-9600)

COMPUTER HORIZONS CORP.

747 Third Avenue, Department CW 8/15
New York, New York 10017
An Equal Opportunity Employer M/F

SOFTWARE ENGINEERS SUNBELT TO 70K

UNIX, C, PASCAL, DEC/PDP-11, REALTIME, INTEL 85/86/88, VAX, RSX-11, SCADA.

To explore sunbelt opportunities in software design in the above environment call or send resume to:

FOX·morris
personnel consultants

BOB GILLIAN - 1350 Johnston Bldg. Charlotte, NC 28281 - (704) 375-0600
KYLE PURDY - Regency Center 2 - Suite 901 5501 LBJ Freeway - Dallas TX 75240 (214) 934-2260
MIKE HUNTER - 3101 Poplarwood Court Raleigh, NC 27625 - (919) 872-2940

CAREER OPPORTUNITIES ANALYSTS/PROGRAMMERS

Worldwide known and respected company requires Analysts/Programmers to assist in the development, installation and operation of a worldwide mini-computer based communications network. Candidates must have experience with DEC PDP-11/24, RSX-11M operating system and the Assembler Macro-11 programming language. Opportunity for international travel if desired. Offered are excellent benefits/compensation and career opportunity.

Reply to CW-84215
Computerworld
Box 880
Framingham, MA 01701

DATA PROCESSING PROFESSIONALS

We are seeking progressive professionals to fill a variety of positions in our Data Processing Dept. The following positions are available:

Programmer/Analysts

Successful experience in structured techniques using data flows, data dictionaries, data modeling and structured charts is highly desired.

Experience in the apparel/footwear business is helpful, but not necessary.

We offer competitive salaries and excellent fringe benefits. Please submit your resume complete with salary history to:

NIKE

Personnel Mgr.
NIKE, INC.
3900 S.W. Murray Road
Beaverton, Oregon 97005

An Equal Opportunity Employer

position announcements | position announcements | position announcements | position announcements | position announcements

GOOD THINGS HAPPEN ON THE CHESAPEAKE BAY

We're Dynamac Corporation, Information and Management Systems Division.
We've built our success on a history of quality service.

- Development of complex online DBMS applications.
- Innovative use of powerful mini-computer technology.
- Design of large-scale distributed systems.

** IMMEDIATE OPENINGS **

UNIVAC 1100 ... TANDEM 16

SENIOR AND INTERMEDIATE LEVEL POSITIONS
SYSTEMS AND APPLICATIONS
FOR

* PROJECT/TASK MANAGERS
* DATA BASE ADMINISTRATORS/ANALYSTS
* SYSTEMS ANALYSTS/DESIGNERS
* PROGRAMMER ANALYSTS

EXPERIENCE DESIRABLE
UNIVAC: DMS, QLP, TIP, ECL, COBOL
TANDEM: NSI & II, TAL, ENCOMPASS, XRAY, EXPAND
STRUCTURED TECHNIQUES: ANALYSIS, DESIGN

Salaries To 50K
U.S. Citizenship Required
To Schedule Interview:
Call Susan Collect at (301) 468-2500 and Send Resume To:

DYNAMAC CORPORATION

PAX PROJECT
c/o Personnel Dept.
11140 Rockville Pike
Rockville, MD 20852

SUCCESS THROUGH QUALITY
AN EQUAL OPPORTUNITY EMPLOYER

PRESIDENT

Arabian Gulf **US$100,000pa(including perquisites)**

A rare opportunity for the number one position has arisen in one of the most desirable tax free locations in the middle east. The person will head a large software house and should be a computer science graduate with a business administration degree.

Heading more then 80 professionals, the positons requires special skills in organizing, planning and motivating a multi national team. The person must be able to recognize and capitalize on business opportunities, make spot decisions and have exceptional leadership qualities. Ideally the person should have had a minimum of 7 years senior management experience in managing a computer bureau service, time sharing services, computer training, computer related consultancy services, applications software development and fields thereof. A working knowledge of Arabic and or French will be preferred. Persons currently earning less than $50,000 per annum need not apply. Application with detailed CV should be sent in strict confidence to:

Reply to CW-B4237
Computerworld
Box 880
Framingham, MA 01701

USER SERVICES COORDINATOR
UNIVERSITY OF WISCONSIN-PARKSIDE

The University of Wisconsin-Parkside seeks a creative individual for our data control area. This individual is to be responsible for user services, including effective client communications, computer job set-up, scheduling, tape library, and basic quality control.
Previous experience in a data control area is required. Experience in IBM job control language in a teleprocessing enironment is preferred.
Beginning salary of $16,500. Advanced educational opportunities available.
Send resume to:

William Misamore
Director, Computer Center
University of Wisconsin-Parkside
Box No. 2000
Kenosha, WI 53141

AN EQUAL OPPORTUNITY EMPLOYER

SENIOR SYSTEMS ANALYST

Large center-city health care institution, located in Philadelphia, PA, is seeking an individual experienced with hospital information systems, both clinical and financial, and 2-4 years' experience in data processing, programming or systems development.

Position also requires experience with IBM equipment, distributed processing and data communications systems, and extensive vendor interface experience...user interface a plus. Supervisory skills along with BA degree in Computer Science, Business or related field preferred. Data base management systems experience helpful. Send resumes to:

BOX CW-B4234
COMPUTERWORLD
BOX 880
FRAMINGHAM, MA 01701

Affirmative Action Employer

INFORMATION SYSTEMS
ADMINISTRATIVE DATA PROCESSING

LOS ALAMOS NATIONAL LABORATORY

The Los Alamos National Laboratory, a multifaceted research and development facility operated by the University of California for the Department of Energy, has several positions available for Senior Programmer/Staff Member. These positions require extensive experience in developing financial, personnel, and/or materials management COBOL software systems.
Duties and responsibilities include the design, implementation, and maintenance of administrative data processing systems in a structured environment. The development of on-line applications using COBOL operating under CDC, NOS, or VAX VMS, will be oriented toward the administrative end-user.
These positions require extensive professional level experience in data base management for ADP Information Systems. A Bachelors degree or equivalent in Business Administration or Computer Science is required. An M.B.A. is desirable.
The laboratory is located in the mountains of north-central New Mexico. The area offers excellent recreational opportunities that includes hiking, camping, fishing, skiing, tennis and hunting. The Laboratory provides an impressive benefits package including 24 days annual vacation and 11 paid holidays.
For interview: Don Shafer will be in the San Francisco area on August 20 and 21, 1983 to conduct personal interviews. To arrange for an interview in the San Francisco area prior to Mr. Shafer's visit, please call (505) 667-3666, collect, or contact him in San Francisco at the Dunfey San Mateo Hotel, (415) 573-7661, during the interview period between the hours of 9:00 a.m. and 6:00 p.m. If unable to interview, submit resume in confidence to:

Elmer Salazar
Associate Group Leader, ADTS/ADC
Los Alamos National Laboratory, DIV 83-Y
Los Alamos, NM 87545

University of California
Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

An Affirmative Action/Equal Opportunity Employer
Women, Minorities, Handicapped and Veterans are urged to apply.

DIVISIONAL MANAGER

U.A.E **U.S.$35,000pa**

A large and progressive multi national group with its head office in the U.A.E. requires a manager to head it existing computer division, having sales/support staff in excess of 30 persons. This division is responsible for the sales marketing and hardware/software throughout the Arabian Gulf of well known brands of computers (micros, minis, word processors and allied data processing equipment).

Incumbent will manager the division as an indpendent profit center. He will also be responsible for liaising with principals developing new agencies etc. The job requires considerable initiative dynamism and individual decision making.

Candidates should be graduates in electronic engineering or computer sciences with post graduate studies preferrably degree in business manager with at least 5 years senior managerial level experience in mainframe computer systems sales support operation.

In addition to the salary mentioned above perquisites include furnished family accomodations, car, gratuity, annual leave passages, etc. Please apply in strict confidence to:

Reply to CW-B4239
Computerworld
Box 880
Framingham, MA 01701

ATLANTA, GEORGIA

DATA PROCESSING OPPORTUNITIES
INTERVIEWING AND RELOCATION PAID

S/A...4341, DOS/VSE, COBOL, CICS-Ins/Fin. Appl.-$35,000
P/A...43XX, 30XX, MVS, BAL, COBOL, DB/DC-Fin. Appl.-$30,000
S/A...3031, OS/JCS, CICS-Banking Appl.,-$35,000
CICS MACRO SPEC....370, 4331, O/S-COBOL-Fin. Appl.-$35,000
MIS DIRECTOR...4341, DOS/VSE, COBOL-Retail Appl.-$35,000
MARKETING SUPPORT...HP, Exp. In Mfg/Dist And/Or Fin.-$35,000

PARTIAL LISTING

All Fees Paid By Hiring Company
CALL, SUBMIT RESUME
IN COMPLETE CONFIDENCE

FLAIR DATA
525 Lenox Twr., 3400 Peachtree Road, Atlanta, GA 30326
(404) 231-0101

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $112.70 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $225.40 per insertion. Extra space is available in half-inch increments and costs $56.35. Box numbers are $15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired:

_____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____

Title: _____

Address: _____

Telephone: _____

Send this form to:

CLASSIFIED ADVERTISING,
COMPUTERWORLD
375 Cochituate Road,
Box 880,
Framingham, MA 01701

MANAGER

Growth has created a need for a dynamic shirtsleeve manager to take charge of data processing software company located in Rolling Meadows, Illinois. To qualify college degree minimum 5 years experience GOOD presentation skills, prior supervisory experience, knowledge of COBOL, RPG, OS, CICS, IRX. Proven ability to estimate software projects and to meet TIGHT time budgets. Ability to communicate with management at all levels. If you qualify we offer an excellent salary, fringe benefits, equity participation.
Please send resumes to:

Data Search Consultant
Attn: C. Gorte
141 Coral Lane
Wheeling, IL 60090

Postion to be filled by September 15.

PROGRAMMER/ANALYST

St. Vincent's Medical Center located in Jacksonville, Florida has an excellent opportunity for an individual who can program in COBOL in an on-line environment using CICS/VS and DL/I. A knowledge of other programming languages, PCS/ADS, DOS/VSE and VSAM would be a definite plus for any candidate.

Direct resume to Kaye Lunsford, Assistant Director, Personnel, St. Vincent's Medical Center, P.O. Box 2982, Jacksonville, FL 32203 or call 904-387-7307 for more information.
E.O.E.

IMMEDIATE SAN DIEGO OPENING

National Medical Computer Services, Inc. is looking for a key individual for new R & D projects with the following:

* familiarity with hospital management systems, particularly A/R billing;
* exposure to IBM System/3, 34 or 38;
* strong working knowledge of RPG II;
* systems analysis and design experience.
* additional position for Pascal PC telecomm expert.

In addition to a very competitive salary and benefits, we offer a unique profit sharing program. Send resume and salary history to:

Rex Ford, 6150 Mission Gorge Road, Suite 100, San Diego, CA. 92120 (619) 280-7592.

Data Processing Career Opportunities

Senior Telecommunications Specialist

Education: Bachelor's Degree — Technical discipline preferred. Specialized Teleprocessing Training.

Experience: Seven (7) yrs. with large scale T.P. oriented computer systems including two (2) yrs. experience designing complex T.P. networks.

Responsibilities: Evaluate T.P. alternatives. Provide Company management with comprehensive T.P. guidance and direction. Plan for and design an effective T.P. network; technically support its acquisition, installation, operation and disaster recovery planning, and evaluate its effectiveness once installed.

Senior Technical Analyst

Education: Bachelor's Degree in a Technical discipline — Computer Science preferred.

Experience: Seven (7) years with medium to large scale computer systems including three (3) years actually evaluating alternatives, planning for and formally recommending computer systems.

Responsibilities: Provide Company management with high level computer system capacity planning, configuration design, hardware/software recommendations, and technical support for computer acquisition, usage accounting, insurance coverage and disaster recovery planning.

Working Environment

Both of these positions are part of a small technical support group which will afford maximum exposure to the individual selected. Company has multiple CPUs running both OS and VM systems with a 300 terminal network (3270 type). For consideration, please submit last three years salary history and resume to:

Employment Office (1-16)

UI United Illuminating

P.O. Box 1564
New Haven, Conn. 06506
Attention: Dept. T.S.

An equal opportunity employer — women, minorities, handicapped and veterans urged to apply.

PROGRAMMERS/ANALYSTS

Defy Mediocrity.

When you examine the considerable percentage of time spent at your job, it's just not enough to be content with the ordinary. You have to make the most of that time, enjoy it to the fullest. For DP professionals like yourself, you need challenges. Responsibilities. And most importantly, variety.

You'll find all this plus more when you make your move to National Systems Analysts, Inc. A nationally—recognized leader in the computer consulting industry, we continue to enjoy success after success, based on the efforts of our highly-skilled team of professionals. People who, like yourself, won't settle for anything less than the best.

At present, we're seeking Programmer/Analysts with at least 2 years experience in one of the following Data Base languages to compliment our dedicated staff:

- **IDMS**
- **ADABAS**
- **FOCUS**
- **IMS**

Of course, as an NSA professional, you'll enjoy unparalleled growth opportunities, the variety and challenges you crave, and the recognition you deserve. You'll also enjoy an excellent salary plus expenses and a generous benefits package (including company car, stock purchase plan and tuition assistance). For immediate consideration, please submit your resume with salary history to:

NSA, Inc.
CW-B 4238
COMPUTERWORLD
P.O. Box 880
Framingham, MA 01701
Equal Opportunity Employer

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide; you decide.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211, Dublin Hall
1777 Walton Rd., Blue Bell, PA 19422
(215) 629-0595

From outside New Jersey, call toll-free 800-222-0153

RSVP SERVICES
Employment Agents for Computer Professionals

For software development and computer services expertise...

...Gesco's The One.

Just ask our clients - a who's who of the financial industry. For over a decade they've relied on our large staff of experienced professionals to provide the advanced data processing services and systems that are of paramount importance to their highly technical operations.

We currently support a telecommunications network of over 7,000 ON-LINE terminals run in a large-scale, multiple CPU environment utilizing MVS/SP, JES2, CICS, ACF/VTAM, ACF/NCP, TSO and INTERACT. And as a result of our steady growth, we're seeking the following individuals to join us at our headquarters in FRESNO, CALIFORNIA.

PROGRAMMER/ANALYSTS (CICS/COBOL/ASSEMBLER)

These positions require a minimum of 4 years' CICS, COBOL, and/or Assembler programming experience within a large IBM mainframe environment. A solid background in structured programming techniques plus experience within the financial industry is REQUIRED.

TANDEM PROGRAMMER/ANALYSTS

These positions require a minimum of 2 years' TANDEM experience using TAL, ENSCRIBE and PATHWAY. Additionally, you should have Data Com experience with SDLC and BiSync Protocals. Experience with ATMs, large IBM mainframes and project management or supervisory experience is a strong plus.

CICS SYSTEMS PROGRAMMER

With the responsibilities for designing and the implementation of a new CICS software installation, you are required to have a minimum of 3 years' systems programming experience in a large scale MVS environment. A strong background in TSO, SPF, SMP-4 and system utilities is preferred. Experience in a multi-CPU shared DASD environment is a plus.

Fresno is just three hours from the San Francisco Bay Area and offers an outstanding educational system, climate and AFFORDABLE housing. We offer a competitive salary and benefits package including RELOCATION.

For immediate confidential consideration, please send resume to:

gesco corporation

3747 East Shields Ave., Fresno, CA 93726

Equal Opportunity Employer M/F

Programmer

PL-1/OS TRAIN CICS

Prestigious financial service org is expanding its development systems group. Opptys exist for several intermediate & senior level prog/analysts with solid PL-1 skills. Additional expertise in COBOL & CICS are pluses. Train in all state-of-the-art DP. Tremendous upward mobility withing dynamic environment. Superior benefits pkg. $35,000 FEE PAID

ROBERT HALF OF NEW YORK, INC.
522 Fifth Avenue
New York, N.Y. 10036
212-221-6500 (agency)

PROGRAMMER

Professional association located in Palo Alto, CA. has immediate opening for Programmer. Degree in Computer Science preferred. Documentation experience required. Experience on HP 3000 and Quasar Powerhouse products (Quick, Quiz, QTP, Qschema). Ability to design, write, and implement business applications. Good company benefits. Salary commensurate with experience. Please send resume and salary history in confidence to:

Reply to CW-B4232
Computerworld
Box 880
Framingham, MA 01701

FORTRAN PROGRAMMER/ANALYSTS

American Greetings, a Fortune 500 manufacturer of greeting cards and social expression products, is offering exceptional career opportunities to experienced programmers. As part of Corporate Research, Scientific Systems and Services develops decision models to solve corporate problems. Your responsibilities include the development and programming of software of a mathematical nature used by various departments.

Ideally you have:

- Degree in Mathematics or Computer Science with an emphasis in quantitative analysis
- Minimum of 2 years programming experience using FORTRAN for applications development involving statistics, modeling, or numerical analysis

Please send your resume and college transcripts to: **Employment Manager, American Greetings Corporation, 10500 American Road, Cleveland, Ohio 44144.** An Equal Opportunity Employer.

AMERICAN GREETINGS

position announcements | position announcements | position announcements | position announcements | position announcements

SYSTEMS ENGINEERING OPPORTUNITIES

CITGO PETROLEUM CORPORATION, a rapidly expanding organization, has excellent employment opportunities for Systems Engineers.

Systems Engineers in the MVS/JES 3 System area must have 4 years system programming experience, with at least 2 years MVS/JES 3. Responsibilities include generation, maintenance, problem identification and performance tuning.

Systems Engineers in the CICS Software area must have 4 years system programming experience, with at least 2 years CICS. Responsibilities include installation, maintenance, and consultation with applications programmers.

If you have the above qualifications and are interested in becoming a part of a progressive organization with excellent benefits, please send a resume or letter of intent in strictest confidence to:

Corporate Personnel Department
CITGO PETROLEUM CORPORATION
File I002
P.O. Box 3758
Tulsa. Oklahoma 74102

(Principals Only, Please)

An Eq al Opportunity Employer M/F

DIRECTOR, DATA PROCESSING

Cedars Medical Center, a major 525-bed Florida health care facility, is seeking a data processing professional to direct the implementation of advanced health care systems. Cedars Medical Center has recently decided to implement Technicon's medical information and financial management systems.

The qualified applicant should have significant experience in the implementation of health care systems in a health care facility. This experience should include patient and general accounting, patient registration and order communications. In addition, experience with large IBM mainframes, such as the 4300 series, and related operating software and utilities is essential.

Hands-on experience with the Technicon systems as well as a Bachelor's degree are preferred.

Cedars Medical Center offers excellent salary and comprehensive benefits including free medical, life insurance and relocation assistance. For immediate consideration, forward a resume and salary requirements in strict confidence to: **Elly Howard, Associate Director, Human Resources.**

Cedars is the exception.

Cedars MEDICAL CENTER

1400 N.W. 12th Avenue, Miami, FL 33136
Equal Opportunity including Qualified Handicapped Individuals Employer

DATA PROCESSING
S.E. BANKING CAREERS

PROGRAMMER ANALYST TO: $30,000 2-5 yrs banking exp., prefer CD, sys. experience and knowledge of Florida software packages.

PROGRAMMER ANALYST TO: $30,000 2-5 yrs exp. Prefer fixed assets/accounts payable knowledge. Will involve heavy user interface.

PROGRAMMER ANALYST TO: $30,000 CPCS - COBOL/ASSEMBLER. Requires good communication skills plus ability to work with user groups.

PROGRAMMER ANALYST TO: $30,000 3600 experience. CICS, MACRO. Will also require extensive user interface.

SYSTEMS PROGRAMMER TO: $35,000 Minimum 2 yrs exp. Coordination of capacity planning/performance tuning. Requires MVS/SP, AFC/VTAM, IMS, CMF, BEST/1 or Crystal. Must possess good written and oral comm. skills.

All positions offer excellent career opptys, plus exceptional benefits and competitive salaries. For information of the above and other DP positions contact Larry Stone, at 704-375-0600 or send resume in confidence to:

FOX-MORRIS
Personnel Consultants
1350 The Johnston Bldg.
Charlotte, NC 28281

SOFTWARE MANAGER

University of California
BERKELEY

Computer Systems Designer and Manager of 20-person Applications Software Group. Responsible for designing, evaluating, installation and maintaining software used for research and instruction. Computer systems; Large IBM CMS and all VAX UNIX network, plus assorted micro. Salary range: $38.7K-$46.9K.

Benefits include medical and dental, three weeks annually paid vacation, and excellent retirement.

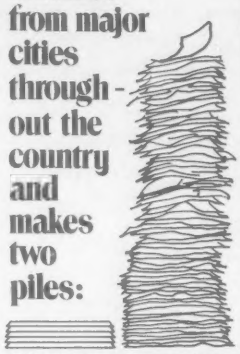
Deadline Septebmer 2, 1983

For information call: Barbara Morgan:

(415) 642-5567

To apply, send resume to Personnel Office, Box 07-424-44, 2539 Channing Way, UC Berkeley, Berkeley, CA 94720. The university of California is an equal Opportunity, affiramtive action employer.

Our computer carefully inspects resumés from major cities through-out the country and makes two piles:



QUALIFIED FOR YOUR OPENING | UNQUALIFIED FOR YOUR OPENING

Find an MBA on our MLS.

ROMNET℠ is our instant electronic telecommunications system, a nationally-linked, multiple listing service that allows your ROMAC® professional to alert every ROMAC® office in the country of your company's new opening.

Because ROMNET℠ also stores resumé information on an applicant's skills, experience, education, salary expectations and geographical preference, we can begin searching for your new accounting, data processing, or banking key employee immediately.

Free yourself of the hassle of handling dozens of introductory interviews. Contact your ROMAC® professional today, and let us take care of those details for you. We'll bet our experience against your company's needs because the ROMAC® difference is experience.

ROMAC

CORPORATE OFFICE
Three Canal Plaza,
P.O. Box 7469 DTS, Portland, ME 04112
800-341-0263 or 207-773-6387

SENIOR SYSTEMS ANALYST/ DATA BASE MANAGER

($35,911 - $41,574)

IBM Experience Preferred

Obtain job descriptions/applications at Personnel, San Jose Community College District, 4750 San Felipe Road, San Jose, CA 95135, (408) 270-6406.

Positions to be filled **AS SOON AS POSSIBLE.** Send applications and resumes to Personnel Office **IMMEDIATELY.EOE**

CRC Systems, Inc., 4020 Williamsburg Court, Fairfax, Virginia, 22032, a high-tech telecommunications organization needs **IMS DB/DC Programmer-/Analyst.** Full time employees or subcontractors. Call or send resume to **Jim Lloyd, (703) 385-0440.**

BANKING
SUNNY CAROLINAS

We have been retained by out client to locate Project Leaders, Systems Analyst & Prog/Analysts with IBM experience in any of the following areas: DDA; Commercial Lending; MSA General Ledger positions. Banking or Savings & Loan Bkg., To $35,000 + all expenses paid.
Confidentially call (919) 471-6404 or write 3101 Guess Rd., Suite C, Durham, NC 27705.

LOUIS A. LEIMONE, CPC
VIP PERSONNEL

CURIOUS ABOUT CLASSIFIED?

If you are interested in advertising with **Computerworld**, but don't know how to do it, give us a call! We will be glad to send you our current rate card, which explains sizes, costs, deadlines and requirements. Along with that, we can send a demo paper which actually shows examples of ad sizes, typefaces, and prices. All you have to do is ask! **Our toll free number is 800-343-6474, in Massachusetts call (617)879-0700, just ask for the Classified Advertising Department.** Or, you can look for our classified order form located in the classified section of Computerworld. Fill it out, attach your ad with a check, and return it to us. Computerworld Classified Advertising, 375 Cochituate Rd., Box 880, Framingham, MA 01701. We're anxious to help!

Applications Programmer

Rheem Manufacturing Company has an immediate opening for an Applications Programmer - Intermediate. Qualified applicants should have 18 months experience in COBOL programming using MVS/CICS/IMS. Two year Associate Degree in Computer Science desired. Excellent salary and benefits package. Send resume to **Personnel Office, Rheem Manufacturing Company, 5600 Old Greenwood Rd., Portsmouth, AK 72903**

Equal Opportunity Employer M/F

SALESPERSON

To sell single/multi-user microcomputer systems to small-/medium sized businesses. Average sale $15,000-$35,000. Salary terms negotiable. Experience a must.

Call Bob Golub
(603) 883-2386

New Mexico State University Computer Center is seeking a candidate for the position of **Systems Programmer III.** NMSU supports MVS and VM/CMS in a multiple CPU environment (AMDAHL V/5 & V/6). A bachelors degree in a scientific or computer discipline is desired but a suitable combination of course work and experience may be substituted for this requirement. At least one years experience with MVS and/or VM is required. Additional experience with Networking of other Systems areas would be helpful. The starting date will be September 15, or ASAP. The salary range is $24,000 - $32,000. Benefits include 22 days of annual leave. Application deadline is August 26, 1983. Send application and resume to **Dave Rocks, NMSU Computer Center, Box 3AT, Las Cruces, NM 88003.**
NMSU IS AN EQUAL OPPORTUNITY AFFIRMATIVE ACTION EMPLOYER

WASHINGTON, D.C.

PROGRAMMER ANALYST?

Metro area company seeks S/34 and S/38 experts. Must know RPG and management projects. COBOL is a plus. To $33K.

ROBERT HALF
OF WASHINGTON, INC.
7316 Wisconsin Ave Ste 401
Washington, D.C. 20814
(301) 652-1990

position announcements | position announcements | position announcements | position announcements | position announcements

Your future is in Florida!

Florida's most prestigious consulting firm is looking for EDP Professionals to move up to consulting status. What better place to make the moves than in the exciting, fast growing Sunshine State.

For the Orlando area, we are looking for EDP Professionals with 2+ years experience with the following qualifications:
- PL - 1, ADF, IMS/DB-DC, MVS, TSO/SPF
- COBOL, CICS, MVS, TSO/SPF (MANUFACTURING BACKGROUND)
- VM/CMS, FORTRAN
- MODEL 204 DATABASE

For the Tampa area, we are looking for Programmers and Programmer Analyst with the following qualifications:
- Hardware: Honeywell DP - S/8
- Language: FORTRAN

For the Sarasota area, we are looking for Programmer/Analyst with the following qualifications:
- 3600/4700 Banking Terminals, BAL, FCL, IMS or IDMS

Send resume, along with salary history, to:
Mr. Fred Pawlaczyk
Corporate Technical Manager, at the address below:

SOFTWARE SERVICES INC.
A subsidiary of Orbitron International
One Plaza Place, N.E. • Suite 400 • St. Petersburg, FL 33701
(813) 823-7138

Software Professionals

APPLIED DATA RESEARCH, the world's oldest and largest independent systems software products company, is seeking software professionals for employment in Dallas or Princeton with experience in one or more of the following:

Software Development

- **IBM systems software development using IBM Assembler and Macro Language**
- **Personal/Micro Computer software development using 'C' language**
- **Data Base/Data Communications software development**

Software Support

- **Systems software positions available for both intermediate and senior level personnel in software product support.**

For confidential consideration send a resume, including salary requirements, to Mr. E.D. Smith, Director of Technical Recruiting, **APPLIED DATA RESEARCH, INC.**, Route 206 & Orchard Rd., CN-8, Princeton, NJ 08540.

APPLIED DATA RESEARCH

An equal opportunity employer

DIRECTOR OF COMPUTER SCIENCE

The University of Missouri-Kansas City is seeking a Director of Computer Science. The Director, who will report to the Vice Chancellor for Academic Affairs, will have responsibility for the undergraduate and graduate programs in Computer Science.

UMKC is entering into a cooperative arrangement with a major computer/telecommunications corporation to plan, develop and implement a graduate program in Computer Science which will address the disciplines of telecommunications, systems design and engineering, computing technology and video systems. The objective of the cooperative program is to advance knowledge in computer science and associated sub-fields and to create new technical, research, educational, service, employment and commercial opportunities in the Kansas City area.

The Director will work with the Chief Scientist of the corporation in the selection of individuals who will have joint responsibilities as faculty members at UMKC and who will also conduct research for the corporation. The Director will also work with other interested businesses and industry in the establishment of future joint faculty appointments and the development of cooperative research ventures.

The candidate must have a Doctorate in computer science, electrical engineering, physics, or mathematics and must have considerable experience in computer science and/or telecommunications, either in higher education or industry. College teaching experience is required. Salary is commensurate with experience. A review of applications will begin by August 15, 1983, with appointment to be made as soon thereafter as possible. Applications should be received by November 1, 1983.

Interested candidates should send their resume with names of no less than three references to:

Dr. Eugene P. Trani
Vice Chancellor for Academic Affairs
University of Missouri-Kansas City
5100 Rockhill Road
Kansas City, Missouri 64110

An Affirmative Action, Equal Opportunity Institution

PROGRAMMER/ANALYSTS

The Upjohn Company, a leading pharmaceutical company located in Kalamazoo, Michigan, is seeking data processing professionals for project development or to support application oriented systems.

Applicants must possess a BS degree plus 2 years' experience in APL or COBOL and strong analytical skills; additional experience with TSO/SPF, IMS, and ADF are highly desirable.

Kalamazoo is a mid-sized Southwestern Michigan community offering a mix of cultural/recreational opportunities including lakes, nearby colleges, and a four-season climate. The Upjohn Company offers a competitive salary and benefits, and relocation assistance.

For confidential consideration, **please call toll free from outside of Michigan 1-800-253-8600 and ask for extension 3-6767; or, from Michigan, call collect at (616) 323-6767.** We'll send a specialized employment application to you immediately. Please refer to ad number 15227-E when calling.

An Equal Opportunity Employer M F

Upjohn

Our computer can help you get here or stay here. Four WATS lines; 13 years' experience; 270 affiliated offices; 300+ current job orders; 3000+ company clients from Virginia to Texas to Florida! Send resume to:

DATA RESOURCES, USA
Division of Landrum Personnel Resources
P.O. Box 1373C
Pensacola, Florida 32596-1373
CALL TOLL FREE (800) 874-2407
IN FLORIDA (904) 434-2321 COLLECT

PROGRAMMERS

Large progressive agri has positions available for experienced programmers with NCR background. Must be proficient in COBOL; BOSS/3 background is desirable. Company is located in San Joaquin Valley and has an excellent benefits package. Send resume and salary requirements to **Box CW-B4233, Computerworld, Box 880, Framingham, MA 01701**

Match your high performance hardware with high performance "peopleware."

If you, and your users, are frustrated by DP staff vacancies, call us today! We'll find, screen and help you hire the professionals to do the job you want done.

Call our DP specialist listed in your area:

ALABAMA
Huntsville 205/539-2244
Mobile 205/479-6566
Tuscaloosa 205/345-0120

ARIZONA
Scottsdale 602/941-1515

ARKANSAS
Little Rock 501/661-1650

CALIFORNIA
Burlingame 415/692-8500
Laguna Hills 714/768-9112
Los Angeles (Encino) 213/906-3155
Menlo Park 415/328-8024
Newport Beach 714/553-0311
Oakland 415/452-0140
San Diego 619/299-4940
San Francisco 415/981-5950
Santa Barbara 805/683-1451
Santa Rosa 707/526-9500

COLORADO
Boulder 303/447-9900
Colorado Springs 303/471-3620
Denver 303/758-8585

CONNECTICUT
Hamden 203/248-0770
Hartford 203/528-4434
Stamford 203/324-2232

FLORIDA
Bradenton 813/792-2568
Clearwater 813/796-1972
Jacksonville 904/356-8513
Lakeland 813/665-8077
Miami (Coral Gables) 305/448-1608
Miami (North) 305/576-5260
Pensacola 904/476-1703
St. Petersburg 813/577-2116
Sarasota 813/923-3671

GEORGIA
Atlanta 404/455-4132
Atlanta (North) 404/998-1555
Atlanta (Northwest) 404/955-2785
Augusta 404/736-3327

IDAHO
Boise 208/336-6770

ILLINOIS
Barrington Hills 312/639-1112
Bloomington 309/828-3317
Chicago (Downtown) 312/648-1800
Springfield 217/753-3100

INDIANA
Fort Wayne 219/432-3500
Indianapolis 317/257-4261
Richmond 317/935-3356
South Bend 219/233-9353

IOWA
Cedar Rapids 319/366-8441
Mason City 515/424-1680
Quad Cities (Bettendorf) 319/359-3503
Waterloo-Cedar Falls 319/236-1510

KANSAS
Overland Park 913/648-1703
Topeka 913/233-6419
Wichita 316/681-3330

KENTUCKY
Lexington 606/269-8865
Louisville 502/456-4330

LOUISIANA
New Orleans 504/581-3655
Shreveport 318/688-4100

MARYLAND
Annapolis 301/841-6600
Baltimore (Towson) 301/823-9010
Columbia 301/995-1040
Frederick 301/663-0600
Laurel 301/953-7000

MASSACHUSETTS
Boston 617/262-5050

MICHIGAN
Ann Arbor 313/769-1720
Birmingham 313/647-2828
Dearborn 313/336-6650
Grand Rapids 616/534-7211
Kalamazoo/Portage 616/381-1153
Rochester 313/652-6800
Saginaw 517/790-5900
St. Joseph 616/429-6555

MISSISSIPPI
Central Mississippi 601/969-5523

MISSOURI
Kansas City 816/221-2377
St. Louis (Airport) 314/731-6800
St. Louis (Downtown) 314/241-5866

NEBRASKA
Omaha 402/397-8115

NEVADA
Las Vegas 702/737-3909
Reno 702/826-5243

NEW JERSEY
Bergen County 201/445-9600
Cherry Hill 609/662-2660
Monmouth County 201/747-2400
Morris Plains 201/538-8800
Princeton 609/452-7711
Sussex County 201/691-2000

NEW MEXICO
Albuquerque 505/298-8151

NEW YORK
Buffalo 716/852-5520
Manhattan-57th Street 212/765-1802
Rochester 716/325-1660
Rockland 914/735-7015
Syracuse 315/471-7161
Woodbury 516/364-9290

NORTH CAROLINA
Burlington 919/229-5381
Charlotte 704/527-6800
Kinston 919/527-9191
Raleigh 919/781-0400

OHIO
Akron 216/867-2900
(Cleveland) 216/621-7387
Canton 216/497-0122
Cincinnati 513/651-5500
Cincinnati (Northwest) 513/851-6661
Cleveland (Downtown) 216/623-0022
Cleveland (North) 216/261-7696
Columbus 614/436-3200
Dayton 513/228-8271
Lorain/Elyria 216/236-3921
Toledo 419/865-6044
Washington Court House 614/335-8744
Youngstown 216/788-4037

OKLAHOMA
Tulsa 918/622-6632

OREGON
Portland 503/287-8701

PENNSYLVANIA
King of Prussia 215/964-1200
Lancaster 717/299-2811
McMurray 412/941-1340
Philadelphia 215/665-9430
Bucks County (Phila. area) 215/757-1543
Pittsburgh (South Hills) 412/922-5200
Reading 215/372-4756
Willow Grove 215/657-6250

SOUTH CAROLINA
Greenville 803/235-8581
Myrtle Beach 803/448-1761
Rock Hill 803/324-5181
Spartanburg 803/573-7427

TENNESSEE
Chattanooga 615/870-2148
Knoxville 615/690-6031
Memphis 901/794-3130
Nashville 615/377-1130

TEXAS
Amarillo 806/353-9549
Arlington (Ft. Worth) 817/469-6161
Beaumont 713/866-0303
Bryan/College Station 713/693-2200
Dallas 214/934-9503
Dallas (Highland Park) 214/521-8810
El Passo 915/778-9411
San Antonio 512/825-8666

UTAH
Salt Lake City 801/364-5700

VIRGINIA
Lynchburg 804/528-1611
Newport News 804/599-5929
Richmond 804/285-2071

WASHINGTON
Seattle 206/328-0936
Seattle-North (Lynnwood) 206/775-0661

WISCONSIN
Appleton 414/731-5221
Green Bay 414/437-4353
Milwaukee 414/273-4430
Racine 414/886-1810
Wausau 715/842-2212

WYOMING
Cheyenne 307/635-8731

COMPU SEARCH® A Division of Management Recruiters
MR MANAGEMENT RECRUITERS®

Understanding your DP needs is our first concern!

HIGH TECH+HIGH FINANCE= GROWTH+OPPORTUNITY+FUN

Schwab depends on its on-line brokerage systems to provide first class customer service and to continue its meteoric growth rate. At Schwab, Information Systems is an integral part of the business—not just overhead. This is your chance to be on the profit side of the business instead of the cost side. You will feel the difference in terms of job satisfaction.

ENVIRONMENT

- Dual 3083's
- MVS
- CICS
- IDMS
  - —IDD
  - —ADS Online/Batch
  - —OLQ
- TSO/SPF
- Color terminals for programmers
- Worldwide, state-of-the-art network
  - —VTAM
  - —Satellites
  - —Remote concentrators
  - —P/C's and home terminals
  - —Audio response

POSITIONS OPEN

- MVS Systems Programmers
- CICS Systems Programmer
- Manager, Data Base Administration
- Senior Data Base Administrator
- Sr. Programmer/Analysts—IDMS/CICS
- Consulting Programmer/Analyst—Brokerage Experience
- Project Leaders—IDMS/CICS, Brokerage Experience
- Sr. Design Analyst
- Series 1 Programmer/Analysts—Communications
- Data Communications Engineers

Information Systems is still a small group. This is your chance to get in on the ground floor! If you are interested in joining America's largest discount stock brokerage firm, please send your resume to:

Charles Schwab & Co., Inc.

A BankAmerica Company / Member, New York Stock Exchange, Inc.

One Second Street, San Francisco, CA 94105

An Equal Opportunity Employer

DEC Scientific Programmer/ Analysts and Service Engineer

G. D. Searle Research & Development Division has several excellent opportunities for Scientific Programmer/ Analysts and a Service Engineer within its Research Computer Services Department. We seek individuals capable of contributing to system analysis, programming, and equipment maintenance activities within a pharmaceutical R&D laboratory complex. If you are such an individual, we invite you to apply for one of the following openings:

Service Engineer—#322-5

The ideal candidate will have a college degree in Electrical Engineering/Computer Science preferably with vendor training on Digital Equipment Corporation (DEC) VAX and PDP-11's, CDC disks, emulex, SI controllers, pertec tape, drives, and asynchronous communications equipment. 2-3 years experience maintaining at least one of the above is required.

Primary responsibility will be to install, maintain, troubleshoot and repair DEC computers and associated peripherals.

Scientific Programmer/Analysts—#315-5

This position offers excellent growth potential for qualified individuals with a solid record of accomplishment in system design, Fortran programming, testing, and documentation. A BS, MS, or equivalent in one of the mathematical, physical, or biological sciences is required with 3-5 years experience, preferably with toxicology and pathology applications, requirements definition, database design and DEC VAX systems.

Searle R&D offers attractive salaries, comprehensive benefits and a challenging work environment. To apply in strict confidence forward your resume to:

Sheila Copeland

Searle Research and Development
Division of G. D. Searle & Co.
4901 Searle Parkway
Skokie, Illinois 60077

An Equal Opportunity Employer M/F/H

SEARLE

SYSTEMS PROGRAMMER

Design and implement a fault tolerant input/output system, including Hot Repair, I/O Drivers, Initialization and Configuration routines, Systems Level Diagnostics. Will utilize logic analyzers in development of this real-time operating system.

Minimum requirements are either: (1) a B.S. in Computer Science and three years experience in computer programming, or, (2) completion of all coursework for M.S. in Computer Science. Applicant must have the ability to perform all job duties.

Full time employment in modern computer design lab. Must be willing to relocate to Pacific Northwest. Salary: $25,000 per year.

Send resumes and references to:

Oregon State
Employment Division
Job Order No. 1760651
875 Union Street N.E.
Room 208
Salem, Oregon 97311

Programmer Analyst

Expansion of M.I.S. Department and promotion of current staff has created openings at our international headquarters in Orlando, Florida. Your skills and two or more years of experience with DL/1, COBOL, Command Level CICS and MVS, JCL can qualify you for a rewarding career with a dynamic, unique organization.

Tupperware offers excellent working conditions and benefits. Send RESUME and SALARY HISTORY to:

Personnel Department
Tupperware Home Parties
PO Box 2353
Orlando, FL 32802

An Equal Opportunity Employer

Halbrecht & Company is currently recruiting for two clients in the Mid-Atlantic area seeking Computer Programmers and Systems Analysts. Of particular interest are individuals with commercial data processing experience on medium and/or large scale hardware. Knowledge of COBOL or Assembler languages as well as CICS and Data Base Management Systems is a plus. Will be involved with the design, development and implementation of new applications in the manufacturing and communications/media areas covering a broad spectrum of applications to include finance & accounting, inventory control, manufacturing (MRP) etc. Companies offer excellent benefits including liberal relocation packages and rapid advancement opportunities. For immediate consideration forward resume to Kurt Willdinson, Halbrecht & Company, 7927 Jones Branch Drive, Suite 400, McLean, VA 22102, (703) 442-0188

SYSTEMS MANAGER

Rapidly growing medical data processing company requires an experienced Systems Manager for RSTS-E/VMS environment. Send resume or call:

Robert A. Reid, M.D., President
Commonwealth Clinical Systems, Inc.
405 Water St.
Charlottesville, VA 22901
(804) 977-1667

Programmer DEC RSTS Houston, TX

Project Leaders or Programmer Analysts needed for growing OEM. Experience with B Plus or B Plus II required. Company is Authorized Digital Computer Distributor and concentrates in several vertical markets. Send resume to **Spartin Systems, 14925A Memorial Drive, Houston, TX 77079**

COMPUTERWORLD CLASSIFIEDS WORK!

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE
- SOFTWARE WANTED
- TIME & SERVICES
- REAL ESTATE
- BUSINESS OPPORTUNITIES
- SEMINARS/CONFERENCES
- BIDS AND PROPOSALS

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with you insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

Ad closing is every Friday, 6 working days prior to issue date.

Rates: Open rate is $112.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs $225.40 per insertion. Additional space is available in half inch increments. Some sample sizes and costs are shown.

1 col X 4" -$450.80
2 cols X 4" -$901.60
2 cols X 5" -$1127.00
2 cols X 8" -$1803.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available, $15 per insertion.

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617)879-0700
New York - (201)967-1350
Chicago - (312)827-4433
San Francisco - (415)421-7330
Los Angeles - (714)556-6480

TELECOPIER SERVICE - (617) 879-0700

William J. Mills, Manager Classified Advertising

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
375 Cochituate Road, Box 880, Framingham, MA 01701/(617) 879-0700

BUY•SELL•SWAP

BUY
SELL • LEASE

DISK
3340 • 3344
3350 • 3380

TAPE
3411 • 3410
3420

Call Bob Ford
or Nelson Johnson

S/38
S/34
S/36
S/3
SERIES/1

Call Gayle Drotar
Roger Odom
Ken Winzen

Personal Computer

370 Systems
4341 • 4331
3031 • 3032
3033 • 3081

Call Jack Harvey
or John Bottom

NEED TO REDUCE EXPENSES?

ECONOCOM'S PURCHASE-LEASEBACK PROGRAM CAN PRODUCE IMMEDIATE SAVINGS ON YOUR PRESENT EQUIPMENT—CALL FOR DETAILS.

ECONOCOM
845 Crossover Lane
P. O. Box 240297
Memphis, Tennessee 38124
901-767-9130
CDLA Member Computer Dealers & Lessors Association

Upgrading?
MEMORY
IBM & OEM
158, 168, 3031, 3033
Call:
Rohn or Bob Miller
(612) 884-3366 CDLA
Centron-DPL Company

THE HARDWAREHOUSE IS HARD TO BEAT FOR PRICE AND AVAILABILITY.

CALL US TODAY AT (602) 248-6848, PHOENIX, ARIZONA
OR CALL OUR LOCAL OFFICE IN YOUR AREA

Boston: Eastern Regional Headquarters (617) 272-8110
Washington, D.C. (703) 525-5233
New York (212) 832-2622
Philadelphia (215) 293-0546

San Francisco:
Western Regional Headquarters (415) 283-8980
Los Angeles (213) 670-7994
Denver (303) 534-7436
San Diego (619) 231-2361
Seattle (206) 447-1682
Phoenix (602) 248-5978
Portland (503) 228-7033
Salt Lake City (801) 298-4281

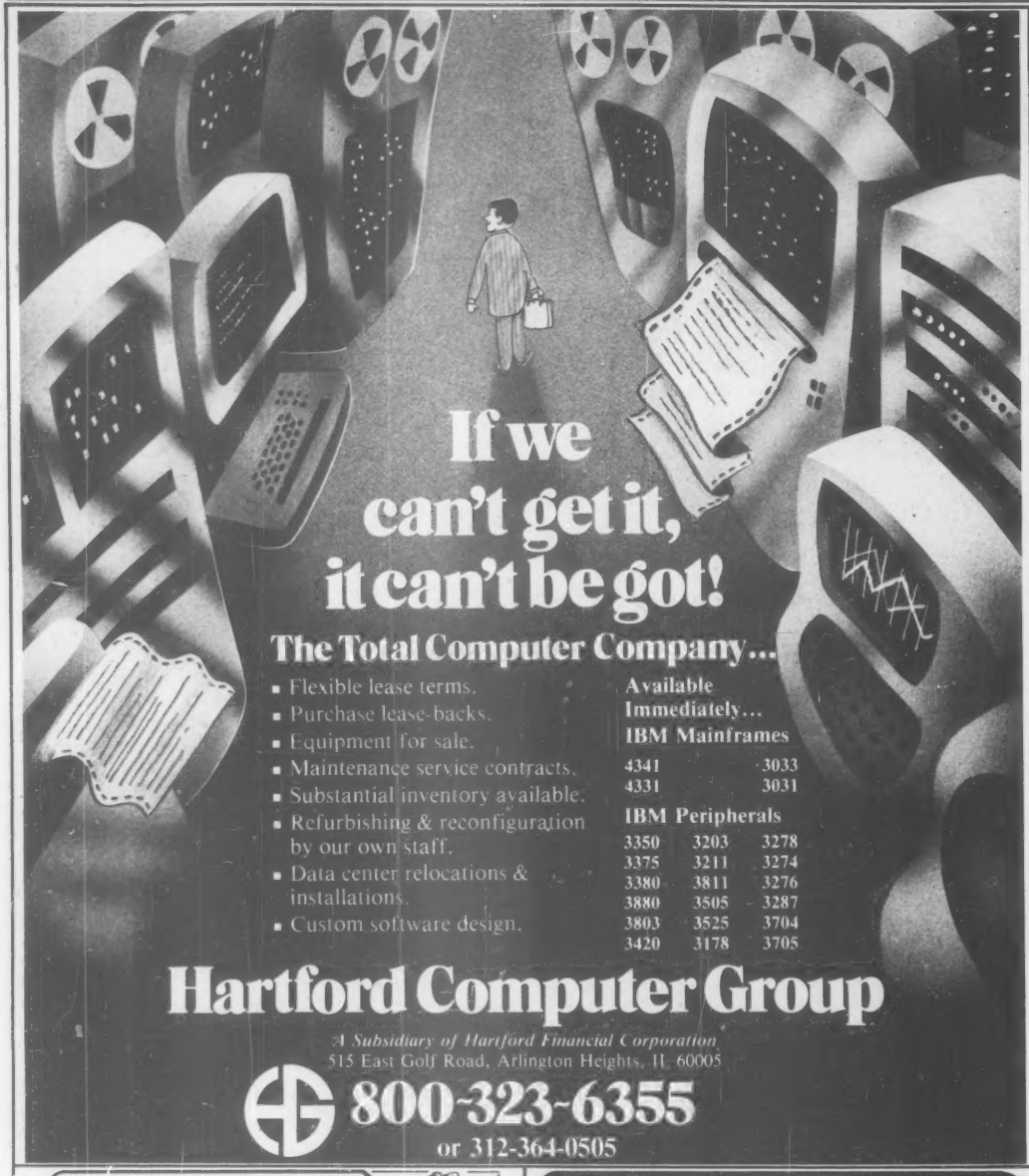
Chicago:
Central Regional Headquarters (312) 789-9100
Pittsburgh (412) 922-8920
Detroit (313) 995-8717

Austin:
Southern Regional Headquarters (512) 451-0121
Atlanta (404) 768-6535
Dallas (214) 233-1818
Houston (713) 629-4440

Canada: Toronto (416) 366-1513
Montreal (514) 281-1925

GREYHOUND COMPUTER CORPORATION
SUBSIDIARY OF THE GREYHOUND CORPORATION
800-528-6113

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap



If we can't get it, it can't be got!

The Total Computer Company...

- Flexible lease terms.
- Purchase lease-backs.
- Equipment for sale.
- Maintenance service contracts.
- Substantial inventory available.
- Refurbishing & reconfiguration by our own staff.
- Data center relocations & installations.
- Custom software design.

Available Immediately...

IBM Mainframes

4341	3033
4331	3031

IBM Peripherals

3350	3203	3278
3375	3211	3274
3380	3811	3276
3880	3505	3287
3803	3525	3704
3420	3178	3705

Hartford Computer Group

A Subsidiary of Hartford Financial Corporation
515 East Golf Road, Arlington Heights, IL 60005

800-323-6355
or 312-364-0505

Hi! Let's talk! We want to tell you about our flexible plans for buying, selling, leasing, renting, purchase/leaseback of **IBM System 34 & 38 and 3741/3742.**
We have a large inventory of CPU's, CRT's, and printers.
We'll even talk about **System/36!**

Call John Spight or Ken Warren

Pearl Computer Division
•P.O. Box 24026 •4717 Centennial Blvd.
Nashville, TN 37202 **(615) 383-8703**

*** * * * DEC * * * ***

BUY—SELL—LEASE—TRADE—CONSIGN

SYSTEMS — PROCESSORS — OPTIONS
PERIPHERALS — MODULES — MEMORY
— SPARES —

NATIONAL COMPUTER EXCHANGE

800-854-7224

6980 Aragon Circle, Suite 5 • Buena Park, CA 90620

(In Calif.)714-522-1870 TWX:910-596-1499

DATA GENERAL
New & Used Equipment

BUY. SELL. TRADE.

McINTYRE'S
Mini-Computer Sales Group Inc.

(313) 583-4100

TLX: 810-232-4866
Answer Back: MCDATAGEN MAHS

32050 Edward Ave.
Madison Heights, MI

SYSGEN DATA Ltd

AVAILABLE IMMEDIATELY

MARKETING MINI-COMPUTER EQUIPMENT & SYSTEMS WORLDWIDE

- DG M 600 1.5 MB MOS MEMORY 6122 S.S. 6026 S.S. ALM 16 ALM 8 SALE PRICE $58,500
- DG M 600 1.5 MB MOS MEMORY 6026 S.S. ALM 16 ALM 8 SALE PRICE $38,500
- SYSTEM CAN BE PURCHASED AS COMPLETE UNIT OR PURCHASED AS SEPARATE COMPONENTS
- ALL HARDWARE IS CURRENTLY UNDER DG MAINTENANCE AND WILL BE CERTIFIED TO THAT EFFECT
- TERMS COD, FOB NY

OUR CURRENT INVENTORY ALSO INCLUDES
DATA GENERAL: DISK DRIVES TAPE DRIVES CPU S MEMORIES TERMINALS PRINTERS AND COMMUNICATIONS BOARDS • CALL FOR PRICE QUOTES
FULLY WARRANTEED FOR DG MAINTENANCE • OVERNIGHT DELIVERY

FOR FURTHER INFORMATION CALL:
SYSGEN DATA LTD. (516) 491-1100
12 ELKLAND ROAD • MELVILLE, NEW YORK 11747
ASK FOR RAPHAEL FELDMAN OR BRIAN COMISKEY

WANTED TO BUY
4331 J1 SYSTEM
(4) tapes, disk, any printer.
Must be available within 45 days
Will lease or purchase
Mr. Stark
(212) 675-0200

SELLING?

Sell your product or service in Computerworld classifieds. Join the thousands of advertisers who use our classifieds because they get results.

You can find buyers for discs and DEC's, terminals and timesharing, software and System 370's.

More than half a million active computer people read Computerworld each week, and you can reach them efficiently in Computerworld classifieds.

To place your ad, or to get a rate card with complete details on Computerworld Classifieds, call or write:

Classified Advertising
COMPUTER WORLD
P.O. Box 880
Framingham,
MA 01701

1-800-343-6474
617-879-0700

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

SYSTEMS
4341 4331
38 34
36
32 3
BUY • SELL • LEASE
COMPUTER BROKERS, INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE
CB
TOLL-FREE
800-238-6405
901-372-2622
PERIPHERALS
3203 3370
3340 3411
3350 3420
asca MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

COMDISCO®

Your First Choice ☑
In The Second Market

IBM PROCESSORS

- ☐ 308X 36-60 Month Leases (ITC Lessor or Lessee)
- ☐ 3033 Available for lease or sale now
- ☐ 3032 Available for short term lease
- ☐ 3031 Available for lease or sale now (along with A/P's)
- ☐ 4341 We're Buyers, Sellers and Lessors of Group I's and II's
- ☐ 4331 Group II's available for lease or sale
- ☐ Memory/Channels available for 303X, 4300 and all 370's

IBM PERIPHERALS

- ☐ 3880/3830 Immediate Availability
- ☐ 3380/3375 Immediate Availability
- ☐ 3350/3370 Immediate Availability
- ☐ 3803/3420 Immediate Availability (All models)
- ☐ 3800 3704/3705 30-day Availability
- ☐ 3811/3211 Immediate Availability
- ☐ 327X We're Buyers, Sellers and Lessors

We Can Put It Together

Eastern Regional Headquarters
(Connecticut) 203/655-1211
New Jersey 201/568-9666
Washington, D.C. 301/441-1000
Philadelphia, PA 215/545-8035
Boston, MA 617/542-4005
Midwestern Regional Headquarters
(Chicago) 312/698-3000
Michigan 313/644-1500
Western Regional Headquarters
(San Francisco) 415/944-1111
South Central Regional Headquarters
(Dallas) 214/641-3255
Atlanta 404/256-5956
Florida 305/428-3177
Canadian Regional Headquarters
(Toronto) 416/968-7135
International Headquarters
(Chicago) 312/698-3000
Latin America 305/666-6258
Paris 01 524 3270
Switzerland 41 (21)71 09 35
West Germany (2434) 5048
Corporate Headquarters
6400 Shafer Court 312/698-3000
Rosemont, IL 60018 TWX 910-253-1233

A MEMBER OF CDLA AND LISTED ON THE NEW YORK STOCK EXCHANGE

ACM
214/385-0354
BUY-SELL LEASE
- All IBM Systems
- Peripherals
- Tapes
- Disks

SERIES/1
- Systems
- Features
- Peripherals
- New systems available at substantial discounts

IBM P.C.
- Lease program for IBM personal computers

PIONEER COMPUTER MARKETING
4835 LBJ Frwy. Suite 680
Dallas, Texas 75234
214/385-0354

PRIME COMPUTER USERS

New 80 and 300 megabyte drives Available for immediate delivery. 300/1440 LPM Printers also available. Nationwide CDC maintenance and financing.

Call Barry Dacks
Timesharing Services Inc.
(904)396-7068

IBM UNIT RECORD EQUIPMENT & DISK DRIVES
DISK PACKS, DATA MODULES, MAG. TAPE, DISKETTES

SALE OR LEASE

machines
026—029—082— 083— 084
085—087—088— 129— 514
519—548—557

disk packs
2316—3336(1)—3336(11)—3348(70)
5 MEG. TO 300 MEG. PACKS—NEW & USED
Highest Prices Paid for Used Packs & Machines

THOMAS COMPUTER CORPORATION
5633 W. Howard St. Chicago, IL 60648
800-621-3906 312-647-0880
Authorized Distributor – Memorex, CDC, 3M, BASF, Verbatim, DYSAM

System/34 Printer & Displays Sale/Lease

WANTED
4341 Grp 1 or 2
For Outright Purchase
Or Purchase-Leaseback
Short or Long Term

Tape Drives
3420
3410 8809
Immediate Delivery

Controllers
3880 3830
3803
Immediate Delivery

DASD
3380 3375 3370
3350 3344 3340
3330 3310
Immediate Delivery

Printers
3287 3289
3203 3211
3262 1403
Immediate Delivery

Control Units
3274 3272
3276 3271
Immediate Delivery

Display Stations
3278 3277
Immediate Delivery

We Buy, Sell & Lease IBM Processors and Peripheral Equipment

CDLA

Contact Bernie Gest 215-782-1010
Computer Marketing Inc.
7704 Seminole Ave. Philadelphia PA 19126

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

WANG* · DEC IBM S-I**

Disk Drives · Band Printers
Controllers · Peripherals · Media

National Authorized OEM-Distributor
Offers New, Fully Warrantied Equipment

DISK DRIVES

WANG #	DEC #	CDC #	ERST-CDC PRICE
2280 (V. 6580)–3	RKO 7	9448	$ 9,400
2265 V–1	RMO 3	9762	8,500
2265 V–2 (6563)	RMO 5	9766	12,900

Prices include installation, 90-day full maintenance (Also available after 90 days), stand, cables, terminator. (Controllers additional.)

BAND PRINTERS

WANG #	DEC #	Data Products #	ERST-DP PRICE
2273-1 (300 LPM)	LP 11–A, B	B–300	$ 5,675
2273–2 (600 LPM)	LP 11–EA, EB	B-600	7,475

Prices include installation, 90-day full maintenance (Also available after 90 days), stand. (Controllers, printer cables additional.)

SPECIAL MEDIA PRODUCTS OFFER WITH PURCHASE

WANG #	DEC #	ERST #		PRICE
2280 (6580)	RKO 7	458–4221	Disk Cart.	$ 156 ea.
2265 V–1	RMO 3	494–4440	Disk Pack	279 ea.
2265V–2 (6565)	RMO 5	490–4574	Disk Pack	642 ea.
2273–1,2	LP 11–A, B, EA, EB	60452	Ribbons (Box of 6)	45.75

*WANG: ERST is the largest dealer in pre-owned WANG equipment —2200, VS, WP (CPUs, Terminals, IOPs, Controllers, Printers, Memory Upgrades).
**IBM Series I: CDC Plug Compatible "Certainty" Series.

ERST
INTERNATIONAL CORPORATION
225 Lafayette Street, New York, NY 10012
CALL TOLL FREE 1-800-FOR-ERST | IN NEW YORK 212-431-1100

Multiple system users!
Budget-beating operating leases
on **System/36's**

We make it easier than ever for you to upgrade **now** to IBM's System/36's. Our rates on 12-to-30-month operating leases are 10-40% under IBM's month-to-month. Customized installation schedules to meet user's needs. We'll take System/34's in trade. Let IBM tell you **why** System/36, then ask us how to do it for less! **Please call us at 203-222-0170.** Datalease Corporation, P.O. Box 467, Westport, CT 06881.

DATALEASE

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Building, Jackson, MS 39201 for the following data processing equipment and services:

Request for Proposal Number 863, due Thursday, August 25, 1983, 3:30 P.M., for the upgrading of a Univac 1900 Code System for the Mississippi State Department of Public Welfare.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Dorothy Hooper or Elaine Knauss,
State Central Data Processing Authority
601/359-1395

SYSTEMS · PERIPHERALS · PARTS

DG | DEC

Phil Thomas 305-392-2006
Bryan Eustace 305-392-2005
Jennifer Eustace 305-392-2007 TELEX 568-670

BUY - SELL - TRADE - LEASE
THOMAS BUSINESS SYSTEMS, INC.

CDC 9766

BRAND NEW IN FACTORY CARTONS

$10,999.00

IMMEDIATE DELIVERY

CALL DEX

714-632-6925

BUY ...SELL... LEASE
NEW EQUIPMENT AVAILABLE THRU IBM'S VAR & VPA PLANTS
S/36
FOURTH QUARTER DELIVERIES
S/38
NEW & USED MACHINES REDUCED PRICES
S/34
ALL MODELS ...QUICK DELIVERY
SERIES 1
CONFIGURED TO YOUR NEEDS
PERIPHERALS
CRT'S.....PRINTERS
DISK.....TAPE.....MODEMS
"CALL COLLECT"
(703) 642-1950

CARLYN

Wash., DC: 5105-Q Backlick Road
Annandale, VA 22003
Denver: P.O. Box 3073
Englewood, Colorado 80155

COMPUTERWORLD CLASSIFIEDS!

There's No Time For DOWNTIME!

So while the industry works on your system's problems, let us work on your business problems. Advertise in--

One insertion will let a potential audience of over a half a milion readers know what you are looking for or have to offer. Whether you are looking to recruit computer professionals, want to buy, sell or lease equipment, have computer time or services to offer, or software packages to sell, and more, Computerworld Classifieds will help you get a lot of exposure and get things done faster.

The open line rate is $8.05 per line and there is a minimum size of 1 column by 2" at a cost of $225.40. We can accomodate up to 5 columns and depth measurement increases by half inch increments.

Ads may be mailed in, cleanly typewritten, with a letter stating the size desired and the issue in which it is to be run. Our team of adtakers will take ads that require no artwork or borders over the phone. We also provide telecopier service.

Any borders, logos, or artwork should be sent in with your ad and must be dark and clear enough to be reproduced.

Computerworld comes out every Monday and our deadline for receiving ads is 10 days (or six working days) prior to the issue date desired.

First time advertisers must send payment along with their first ad.

Our mailing address is:

Classified Advertising
Computerworld
Box 880
375 Cochituate Rd.
Framingham, MA01701

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

Attention!

IBM

SERIES/1
S/34
S/38
5110-5120
S/32

SYSTEM/36

EARLY DELIVERY
GREAT LEASE RATES

BUY
SELL
LEASE

ALL MODELS
SYSTEMS AND
PERIPHERALS
AVAILABLE NOW!

CALL
(408) 425-7333

SOURCE
DATA PRODUCTS, INC.
1114 WATER ST., SANTA CRUZ, CA. 95063

Introducing the latest IBM Equipment for less.

Lease it now with TexCom.

IBM SYSTEM 36
IBM SYSTEM 34
IBM SYSTEM 38
IBM 4300
PERIPHERALS

Buy Sell Lease

Trade Ins

Call Collect
512-349-9955

San Antonio Memphis
Houston

TexCom™
• Equipment Leasing Services

NEW USED

UNBEATABLE PRICES

T.I. Specialists*

ADDS
DEC
DIABLO
HAZELTINE
QUME
TELEVIDEO
TEXAS INSTRUMENTS

TO 50% DISCOUNT

THE COMPUTER BANK
315 Rte. 110, Hunt. Sta., New York 11746
(516) 549-5500
* Printers, Systems, Terminals, VDT's

HOW TO SAVE $30,000 PER MONTH ON A 3083 LEASE.

Lease the same 3083 that IBM leases for over $92,000 per month from Randolph—for less than $62,000 per month. That adds up to savings of $1,440,000 over a four-year lease period. If you're renting an older machine, Randolph may save you even more—and you'll get about four times the throughput in the bargain.

WHEN IS THE BEST TIME TO TALK TO RANDOLPH ABOUT LEASING A 3083?

Now—because Randolph has 3083's available for 4th quarter delivery. But it's never too late, even if you already have a machine installed. Whatever your situation, we can tailor a lease that will fit your exact needs and let you start saving money right away.

TALK TO RANDOLPH NOW.

We can solve problems like these, and more . . .
Stuck with a lease on your old machine?
We'll sublease it, and provide a new lease on a 3083.
Own a 3083 but need cash?
Sell your machine to Randolph, and we'll lease it back to you.
Machine installed on a rental basis?
We'll show you how to end the lease and install a new 3083. Any termination charges can be folded into your new Randolph 3083 lease.

LEASING COMPUTERS IS OUR ONLY BUSINESS.

At Randolph, our people have an average of 18 years in the DP industry . . . from 360's to 3081's. They know all about alternative financing to be sure, but they also know their way around a DP department and the hardware in it.

WE LEASE MORE THAN 3083's.

Whatever your needs, now is the time to talk to Randolph. We provide leases for IBM 303X, 4300 and 3081 systems and peripherals—disks, tapes—as well as 3083's.

UNIQUE FINANCIAL STABILITY.

We're an important part of one of the nation's oldest and leading financial institutions . . . The First National Bank of Boston. 18 years in computer leasing gives added assurance that Randolph will continue as the leader in the computer leasing industry . . . continue to live up to the terms and conditions of our agreements . . . provide upgrades . . . fulfill all of our commitments.

LET RANDOLPH HELP YOU SAVE $30,000 PER MONTH.

We can solve a lot of problems for you, and save you money, too. Talk to Randolph now . . . call Joseph B. Kelly, Jr., Senior Vice President, **800-243-5307**.

537 Steamboat Road
Greenwich, Connecticut 06830
203 661-4200 • 800 243-5307

Randolph

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION **RANDOLPH COMPUTER CORPORATION** *A subsidiary of* THE FIRST NATIONAL BANK OF BOSTON **BANK OF BOSTON**

System **34**
We want to Buy
System **36**
• Deliveries in 1983
• Operating Leases
• FASB qualified

The Datacomp Leasing & Service Group
Toll Free **1-800/323-3289** New Jersey **201/467-8686** Chicago **312/448-4300**

AVAILABLE **3274's** AND DISPLAYS

AVAILABLE **3262-5 4245-1** PRINTERS

AVAILABLE **3430** TAPES

4341's BUY SELL LEASE

NF COMPUTER SALES & LEASING CORP.
950 York Road Hinsdale, IL 60521
CHICAGO (312)920-8181 MINNESOTA (612)854-1018 NEW YORK (516)773-4242

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

SERIES I SPECIAL

Control Data
126 MB Removable Drives $12,900
Diskette Drives $1,495
Printers & Displays

New or Used
Immediate Delivery

IBM
4956 Processors - New
4967 200 MB Disk Drives
All Peripherals and Features

DEC

Check out our unbeatable combination—
huge inventory at low, low prices.

Call toll free 800-328-7000
In Minnesota (612) 894-4020

MIDWEST SYSTEMS, INC.
12117 Riverwood Drive, Burnsville, Minnesota 55337

WANTED TO BUY	AVAILABLE FOR LEASE	WANTED TO BUY
3705-E07	3033-U8	4341

BUY/SELL/LEASE

3350 3370 3375 3380 3860 3420
System 34 And Peripherals
System 38 And Peripherals

LDI
Leasing Dynamics, Inc.
1717 East Ninth Street
Cleveland, OH 44114
(216) 687-0100
Susan Hoell
CDLA

C.D. SMITH & ASSOCIATES, INC.
DEC computer systems & components
12605 East Freeway, Suite 318
Houston, Texas 77015
(713) 451-3112
TELEX 76-2547

DEC

WE ARE BUYING: VAX 11/750, 11/780, H7112-A, H9602-DF, RP06

WE ARE SELLING:

11/780-CP
MS780-DC
MS780-CC
FP780-AA
DW780-AA
H7100-A
H9602-HA
RH780-AA
MS750-CA
FP750-AA
RH750-AA

If you want on our Mailing List, call Valerie (713) 451-3112.

→ **NCR USERS**
Are You Thinking of Trading Up ↑ ? or Down ↓ ?
Call Us for a Quote

SMITH ANDERSON CORP.
619-340-6688

Authorized NCR Systems Distributor - Nationwide
(New or Used Systems)
71-886 Highway 111
Rancho Mirage, Calif. 92270

FOR SALE
IBM SYSTEM/38 Mod 7C1
Comm (2 Lines, SDLC)

Other Peripherals:

3370/A11	(4)5256/003
3411/033	(2)3262/B01
5225/004	(6)3864/001

Available September 1983

Call or Write
SOUTHERN DATA SYSTEMS, INC.
6616 Highway 100
Nashville, Tennessee 37205
800-251-2614
615-352-6565 (In Tennessee)

AMERICA'S LEADER IN BURROUGHS EQUIPMENT
NOW OFFERS
OVER $2,000,000
IN OWNED
BURROUGHS EQUIPMENT
FOR IMMEDIATE DELIVERY
B1800 - B7800
ALL MEMORY, DISK, TAPE, MT's, TD's, PRINTERS
GUARANTEED BURROUGHS MAINTENANCE
602-264-5151
COMPUTER MARKETING CORPORATION
5651 NORTH SEVENTH STREET
PHOENIX, ARIZONA 85014
TLX 165-712
*MEMBER COMPUTER DEALERS & LESSORS ASSOCIATION

BUYING?

Whether you're looking for big computers little computers, terminals, printers, software, time sharing or services,

you'll find it in *Computerworld* classifieds.

Pages of ads every week, with everything from Discs to DEC's from time sharing to terminals, and software for every size computer system.

You'll find what you need in *Computerworld* classifieds.

Call 800-343-6474 (or 617-879-0700) for more information

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
375 Cochituate Road, Box 880, Framingham, MA 01701/(617) 879-0700

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET

REGIONAL MARKETING OFFICES

Atlanta, GA (404) 256-7942
Boston, MA (617) 367-5755
California (408) 773-1614
(415) 956-3183 (714) 752-8443
Chicago (312) 693-2790
Dallas, TX (214) 385-0806
Houston, TX (713) 780-7459
New Jersey (609) 645-7282
New York City (212) 349-0718
Tennessee (615) 449-6633
Washington, D.C. (703) 442-4941
Geneva, Switzerland Telex: 289950 WTCG
Montreal, Quebec (514) 871-1121
Paris, France Telex: 613910 CMI FR
Toronto, Ontario (416) 673-3081
Windsor, Ontario (519) 258-8910

CMI FINANCIAL SERVICES GROUP
755 W. Big Beaver, Troy, Mich. 48084
(313) 362-1000

CMI CORPORATION Since 1969
755 W. Big Beaver, 19th Floor, Troy, Michigan, 48084
TWX/TELEX: 810 232-1667 CMI CORP TRMI
(313) 362-1000
New CMI 4300 Series Hotline Number: 800-331-4300
A Torchmark Company — Member CDLA

3033-U16
Fully Featured
Available Now
Lease or Sale

USED
3081-D's or K's
For Sale or Lease

Series 1
New 4956B's, 4967 Disk
Used 4955F's, 4955E's
Immediate Delivery
Buy-Sale-Trade
Leases Available

3033-N8
Fully Featured
Available Now
Lease or Sale

3081/3083
Lease Financing Available
For Your System or Ours
2, 3, 4 or 5 Year Terms

Series 1 I/O
New or Used
IBM/CDC/Printronics/Datum/Data South/NEC
Printers - ASC11/3102
180 CPS-1130 LPM
Tape Cassettes - Back-up Unit
Datum 20MB-45MB
Disks - Fixed/Removable
9.3MB-240MB
Buy-Sale-Trade Leases Available

3033
S to N to U
Upgrades

Wanted
4341-M2
4341-L01
Call Now

3350 3880 3830
3340 3370 3330
3375 3380
Buy/Sell/Lease
Pat Callahan
Tim Ryan

4341 Hotline
1-800-331-4300
If you are thinking of buying, selling, leasing or adding another IBM 4300 System, call today!

SYSTEM 38
Convert your IBM S/38 Lease to a CMI Leaseback
12-24-36 Month Terms
New/Used CPU's Avail.
Kevin Schaefer

2914
3203 3505/3525
3800 3211/3811
Mary Drangin
3803/3420
Immediate Delivery

AMDAHL
V8 and V611
Available for Sale or Lease

NEW 5224 PRINTERS
Greater Discounts Than IBM Leases Available
5224-1 (140 LPM) $ 165/mo.
5224-2 (240 LPM) $ 188/mo.
Call For Short Term Rates
Immediate Delivery
Kevin Schaefer

Communications
IBM 3705
IBM 3704
Kathleen Austin

ALL IBM COMPUTERS ARE CREATED EQUAL BUT, ALL IBM BROKERS ARE NOT!! CALL US

INTERSTATE COMPUTER EXCHANGE

EXPERTS IN **IBM**
BUY • SELL • 72 HOUR UPGRADES

S/34
IMMEDIATE DELIVERY
ALL PERIPHERALS AND FEATURES
40% TO 50% OFF LIST

S/32 • S/38 • SERIES I • ALL IBM EQUIP.
NEW S/23 — LARGE DISCOUNT!!

GUARANTEED !!
IBM MAINTENANCE • DELIVERY DATES

WANTED: ALL DATAPOINT EQUIPMENT AND S/34's

WANTED —
• ALL S/34 CONFIGURATIONS
• ALL S/34 & S/38 PERIPHERALS
• ALL LEASED & OWNED MACHINES

BUYING OR SELLING EQUIPMENT
WE WILL LIST YOUR EQUIPMENT ON A COMPUTERIZED READOUT. IN MINUTES ALMOST EVERY BROKER AND DEALER IN THE COUNTRY WILL BE INFORMED OF YOUR PENDING SALE OR PURCHASE OF EQUIPMENT.

7578 TRADE STREET SAN DIEGO, CA 92121 — CALL COLLECT — PAUL CAYTON (619) 578-5410

HP

1000
SERIES E,F,M
3000
SERIES II, III, 30, 33

7920
50 MB DISK DRIVE
7970E
1600 BPI TAPE DRIVE
2631B
180 CPS PRINTER
2622A
TERMINAL & MUCH MORE

encore
(213) 393-8268

BROOKVALE
RENT • SELL • UPGRADE • BUY

DEC

PDP 8, 11/03, 11/04, 11/23, 11/24, 11/34, 11/44, 11/45, 11/60, 11/70, VAX/750, VAX/780

SYSTEMS • OPTIONS • SUPPLIES

11/70	512Kb MOS, LA36 (used) *new also available	$48,500
11/34A	256Kb MOS, Dual RL02's, CAB (new)	Call
VAX 730	1Mb MOS, Dual RL02, VMS license (new)	$24,850

Customized Configurations-Call With Your Request.

In Stock		Specials		In Stock	
11/04-DC (unused)	$2,850	FP11-C (used)	$3,950		
BA11-KE (new)	$2,495	LQ P02- AA (new)	$2,495		
DB11-A (unused)	$ 495	MS750-CA (new)	$4,195		
DL11-E (used)	$ 375	RL02-AK (new)	$2,495		
DMF32-AA (new)	$3,495	RLV22-AK (new)	$4,950		
DU11-DA (used)	$ 795	RM03-AA (used)	$7,450		
DUP11-DA (used)	$ 950	RM05-AA (used)	$21,500		
DZ11-E (new)	$3,595	RP06-AA (used)	$14,450		

BROOKVALE ASSOCIATES
40 ORVILLE DRIVE • BOHEMIA, NEW YORK 11716
(800) 645-1167 • NEW YORK (516) 567-7777

DATA GENERAL
We Buy, Sell And Service
New And Surplus Systems and Peripherals
Call Or Write
Hanson Data Systems
(outside Mass. toll free) 1-800-225-9216
(within Mass.) (617) 481-3901
P. O. Box 27, Southboro, MA 01772

DATA GENERAL SPECIALISTS FOR
Surplus New & Used Equipment & Systems
with full depot repair facilities.
CALL US
WE TAKE THE TIME.
- WE CARE -
JM Associates
601 W. Chapel Avenue
Cherry Hill, NJ 08002
609-663-1115

FORSYTHE McARTHUR ASSOCIATES, INC.
DEALER / LESSOR OF IBM Computers and Peripherals
FOUNDED 1971

Home Office
Chicago
919 North Michigan Avenue
Chicago, Illinois 60611
312 943-3770

Branch Offices
Atlanta 404 953-9457
Milwaukee 414 785-9544

CDLA

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

IPS Computer Marketing Corp.

MACK CENTRE III 140 E. RIDGEWOOD AVE. PARAMUS, N.J. 07652

OUR 20th YEAR BUYING, SELLING, AND LEASING IBM EQUIPMENT

EXPERIENCE:

- Twenty years as IBM dealer and lessor
- Public corporation
- Financing available through major banks
- In-house operations department
- International department

EXPERTISE:

Equipment always in inventory
Purchase/leasebacks
Flexible lease terms on new & used equipment
Competitive prices
Refurbishing and reconfiguration available

IBM EQUIPMENT IMMEDIATELY AVAILABLE

CPU			
	3081	3083	4341
	3033	3031	4331
DISK			
	3880	3380	3375
	3370	3350	3340
TAPE			
	3803	3420	3411
PRINTER			
	3211	3203	3800

TERMINALS AND COMMUNICATION
3278 3274 3704
CAD/CAM

TELEPHONE: (201) 262-9500 Telex: 642-197

Established in 1963 Member CDLA

MUST SACRIFICE!! BRAND NEW!!

5456/COO-512K
4959
4963/64A
4997

Ask about other Series/1's
Call 408/425-7333

SOURCE DATA PRODUCTS, INC.

1114 WATER ST., SANTA CRUZ, CA 95063

BUY, SELL, LEASE 5120

4300's/3 S/38, S/1 S/36 S/34

Call Collect: 404-252-7480

DATAMARC
6065 Roswell Rd.
Atlanta, GA 30328

All IBM Peripherals

For Sale Honeywell Computer Model DPS 6/30

Includes: A CRT Model 7200
A Hawk Disk Drive
Texas Instrument Printer
Carries 128 Kilobytes Of Memory
With EDAC Memory Pack
Asking $26,000
For More Information
Call Floyd Townsend
(404) 846-3115

S/38 7G2

Available 8/1/83
Save Over $35,000

CARLYN
COMPUTER SYSTEMS, INC.

(703) 642-1950

Buy - Sell - Lease

S/32 S/34 S/38

IBM 3741 3742

CPU's CRT's PRINTERS
ALL MODELS
PURCHASE-LEASEBACK
SHORT & LONG TERM LEASES

CMA

Computer Marketing of America, Inc.
P.O. Box 90907
422 Acklen Park Drive
Nashville, Tennessee 37209

MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

1-800-251-2670
In Tennessee: 615-297-7516

IBM
3270
PRINTERS, TERMINALS & CONTROLLERS
Please Call: (312) 943-3770
Forsythe/McArthur Associates Inc.
919 North Michigan Avenue
Chicago, Illinois 60611

WANTED TO BUY
DEC Equipment
Vax and PDP-11
Systems-Components-Peripherals
New or Used
Meadowlark Enterprises
Essex St. • Middleton, MA 01949
(617)777-4666

Call Us First or Call Us Last But Call Us For Sure!
BUY • SELL • LEASE

Processor	Peripherals	Banking Equipment
S/23	3741	1255
S/32	3742	1419
S/34	029/129	3600
S/38	5211	
5110	5251	
5114	5225	
5120	5256	
DATAMASTER	3262	

Southern Data Systems 800-251-2614
(615) 352-6565

LEASE ONLY

2501-B2

Available Immediately

METROPLEX COMPUTER COMPANY, INC.
320 Decker Drive • Suite 180
Irving, TX 75062
(214) 258-0541
TWX 910-860-5265

We Buy & Sell
DEC
Systems Components

Digital Computer Resale
call:713 445-0082
600 Kenrick Ste C22
Houston, Tx 77060

VAX SYSTEMS
Full Turnkey Systems
TEU 78 32K
REP07-AA 28K
STC 1953/1935 Formater W/WP Controller 26K
ERGO-301 (VT-102 Compatible) 800.00
Dataroyal Printers
Fujitsu Disk Drives
Emulex Controllers
UNIX Operating System

MANDERS BUSINESS SOLUTIONS, INC.
(303) 693-3035
2771 S. Jasper
Aurora, Col. 80013

COMPUTERWORLD CLASSIFIEDS--

--PROGRAMMED TO HELP YOU.

The computer industry is dedicated to developing greater efficiency and valuable time-saving resources for the business world.

Well, so are ***Computerworld Classifieds.***

And we can deal with a lot of problems. Our classifications include:

Position Announcements -- To help you find the computer professionals right for you.

Positions Wanted -- For individuals seeking full-time, permanent positions-no company ads are allowed.

Buy, Sell, Swap -- For those seeking to buy, sell or lease computer equipment.

Time & Services -- For companies who want to offer computer timesharing or other computer-related services.

Software for Sale & Software Wanted -- Used for buying & selling software packages.

Business Opportunities -- For those seeking individuals or partners in computer-related business ventures, mergers, or franchises.

Real Estate -- For those seeking to sell or lease office space suitable for computer rooms or computerized businesses.

Bids & Proposals -- Used to request for bids on equipment or to invite proposals for desired computer acquisitions.

The Computerworld Bulletin Board -- Our newest addition to the classified pages of Computerworld, this is a low-cost way to buy or sell individual pieces of hardware or software. See below for details on sizes and cost.

The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

Our ad takers will be happy to take smaller sized ads over the phone. We can provide simple line borders for you, if desired.

The open line rate is $8.05 per line and there is a minimum size ad of 2 column inches (28 lines) at a cost of $225.40. Column inches are calculated by multiplying the number of columns wide by the number of inches deep that your ad is. Depth increases in half-inch increments and we accomodate up to 5 columns.

If you wish a box number to be assigned to your ad, it will cost an additional $10.00.

First-time advertisers must send payment along with their ad.

For the ***Computerworld Bulletin Board,*** ads may be sent by mail, by telecopier or given over the phone. Space is available in ***one column by one inch deep units only.*** They are set up using a ***simple format with standard typefaces and no borders or logos are allowed.*** The cost of one standard unit is ***$99.00.*** These units may be combined to form deeper ads.

If you wish to reserve space, or would like more information, call us at 1-800-343-6474 or (in Mass.) 879-0700. All materials should be sent to

COMPUTERWORLD Classifieds
Box 880, Framingham, MA 01701

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

IBM
SYSTEM/34

S/3 • S/32 • S/38
5291 • 5251

3741 • 3742

BUY • SELL • LEASE
REFURBISHED • RECONFIGURATED
SHORT-TERM LEASES
PURCHASE/LEASEBACK

Tennecom MARKETING INCORPORATED
210 SPACE PARK NORTH
P.O. BOX 248
GOODLETTSVILLE (NASHVILLE)
TENNESSEE 37072

800-422-1004
IN TENNESSEE CALL: (615) 859-3872

RK06-AA to RK07-AA UPGRADE

While supplies last
you can upgrade your
Contract RK06 (14 meg)
disk drives to
BRAND NEW RK07's (28 meg)
$3,995.
Includes DEC on-site Installation

SCHERERS
FOR ALL YOUR DEC ACCESSORIES AND SUPPLIES

☆☆ALL NEW☆☆

VT101-AA Basic CRT	$ 975.
VT102-AA w/AVO & PCO	1,275.
VT131-AA w/Editing	1,325.
VT100-AA Expandable	1,375.
RL02-AK Drive w/Pack & Cables	2,250.
MJ11-BE 11/70	1,000.
11/23-AA CPU/128KB/4 Ports	3,475.
DZ11-E 16 Line EIA	3,700.
DD11-CF 4 Slot w/M9202	225.
DD11-CK 4 Slot w/M9202	250.
MXV11-AC 32 KB & 2 SLU	250.

CALL FOR DETAILS
SCHERERS
6145 Scherers Place
Dublin, Ohio 43017
(614) 889-0810

SCHERERS

SUBLEASE AVAILABLE

- IBM 4331-K02 with features 1421, 1431, 1550, 2001, 3401, 5248, 5532, and 3278-A02 console with 4634
- 1442-N1
- 3803-2
- 3420-4 with feature 6425
- (2) 3420-4 with feature 6420
- 3880-1

FOR SALE

- IBM 5231
- (7) IBM 5235

All equipment available immediately. All certified for IBM maintenance. For information call

R Associates
1423 Upland
Houston, Texas 77043
(713) 973-1500

BUY ■ SELL ■ LEASE
PURCHASE / LEASEBACK

All IBM Equipment

Call FREE 1-800-527-6438
FRONTIER®
COMPUTER CORPORATION
4575 S. Westmoreland • Dallas, Texas 75237
214-330-7243

MEMBER AMERICAN ASSOCIATION OF COMPUTER DEALERS

IBM CPU's
3081 3083
3033
4331 4341
SYS 38

Call Dataserv Toll-Free when buying, selling or leasing CPU's or Peripherals
Our numbers speak louder than words

dataserv
509 SECOND AVE. SO. HOPKINS, MN 55343 INTERNATIONAL HEADQUARTERS
TOLL-FREE 800/328-6729 IN MINNESOTA CALL COLLECT 612 933-2575

COMPUCOM

BUY-SELL-TRADE

RP07-AA	$26,250
RP07-BA	$28,750
RP06-AA	$13,250
RP06-BA	$15,750

COMPUCOM INC.
3404 OAKCLIFF RD., C-4 ATLANTA, GEORGIA 30340
(404) 452-1090 / TWX 810-757-0202

IBM
BUY • SELL • LEASE

SERIES 1
S/34 • S/36 • S/38
4300

S/23 S/32 5110-20
Tape•Disk•Printers•Tubes

AMCOM CORPORATION
5200 W 73RD ST. MINNEAPOLIS MN 55435
(612) 835-4737

CALL TOLL FREE
800-328-7723

IBM For Less.

SYSTEM 36'S
- 2 OR 3 YEAR LEASES
- NEW AND USED PERIPHERALS
- TRADE-INS

TexCom™
Equipment Leasing Services
4403 N.W. LOOP 410
SAN ANTONIO, TX 78229
(512) 349-9955

IBM

SERIES/1 AND PERIPHERALS			
4952	4955	4973	4966
4962	4963	4974	4978
SYSTEMS/34 ALL MODELS			
5211	3262	5251	5256
5110	5120	5114	5103
3340	3344	3410	3411
3776	3777	3741	3742

SYSTEM/32
029 129

Want to Buy
S/34 s & Series 1's
All Models

GEMINI COMPUTER CORPORATION

Gene Nicholl
Headquarters
214-934-9152
14229 Proton
Dallas, TX 75234

E. R. McDonald
West Coast Office
213-704-9725
4526 Saltillo
Woodland Hills, CA 91364

WANT TO BUY

IBM-3274s, 3276s, 3277s, 3278s, 3287s

Purchase/Leaseback Inquiries Invited!
Call 214/258-0541

MCC **METROPLEX COMPUTER COMPANY, INC.**
320 Decker Drive • Suite 180 • Irving, TX 75062
TWX 910-860-9285

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

IBM SYS/34 - IBM DISPLAYWRITER

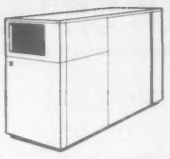
BUY—SELL—LEASE

- IMMEDIATE DELIVERY
- SHORT TERM RENTALS
- GUARANTEED SAVINGS
- GUARANTEED M/A
- PERIPHERALS
- UPGRADES

Call ...

MARION

(1-800) 631-1914
(201) 343-4554
(203) 758-2409



84 KENNEDY STREET
HACKENSACK, N.J. 07602

SERIES 1
S/34 S/38 S/23
5110 4300 S/370
DISPLAYWRITERS
XERXES
COMPUTER SALES
Minneapolis, MN 612-339-3042
800-328-3884

AMDAHL V/8
16 x 16
SUBLEASE
Up To 36 Months
AVAILABLE NOW
CALL:
Paul Peterson or Charlie Berry
MAJOR COMPUTER
INCORPORATED
(612) 933-6000

major computer

TEXAS INSTRUMENTS (NEW)

TI 743	$786
TI 745	$1036
TI 763	$2139
TI 765	$2366
TI 781	$1102
TI 785	$1576
TI 810	$1339
TI 820	$1576

ADDS (NEW)

Viewpoint A2	$550
Viewpoint A3	$510
Viewpoint 60	$730
Viewpoint 90	$965

DIABLO (NEW)

630 RO	$1795
630 KSR	$2480

NEC SPINWRITER (NEW)

NEC 3550	$1945
NEC 7710	$2208
NEC 7715	$2231
NEC 7720	$2573
NEC 7730	$2208

QUANTITY DISCOUNTS AVAILABLE
We Also Discount Computers - NEC
QANTEL - Texas Instruments
THE SKIERS • 516-242-8996
PO Box 754 * 1145 Walt Whitman Road
* Melville, New York 11747

Inflation Fighters
Quality & Savings
Slightly used, Money Back Guarantee. Full Reels. All External Labels Removed Guaranteed for use at 800 BPI through 6250 BPI.

2400' Reel $4.95 ea.
1200' Reel $4.25 ea.
600' Reel $3.50 ea.

All Tapes with Hanging Seals
We pay freight on orders over 200 tapes.
All orders shipped within 48 hours.
Call or Write
Computer Tape Mart
44A Seabro Avenue
N. Amityville, New York 11701
[516] 842-8512

BURROUGHS 6810
BURROUGHS 2930
BURROUGHS 1955
BURROUGHS 4800

BSI
2480 W Alameda Ave
Denver, Colorado 80223
(303) 922-8331
Telex 910-931-0483

DLA Member Computer Dealers & Lessors Association

BIDS & PROPOSALS

Sealed bids are being accepted for sale of Chaves County computer hardware. Minimum bid of $115,000 will be received through August 23, 1983 5 P.M. Chaves County reserves the right to reject all bids. All bids will be clearly marked on the outside of the sealed envelope "This is a sealed bid for computer hardware". Time frame to take possession of hardware is negotiable. Computer hardware for sale consists of the following equipment: PDP 1170 CPU with LA36 Decwriter-2 console terminal, 1.5 Mb of main memory, 2 K bytes cache memory, (1) PR06 176 Mb mass storage with controller, (1) RM05 175 Mb mass storage with adapter, serial line interface, realtime clock, internal memory management, configured in a double H9602 cabinet, (1) 9 track tape drive 8/1600 BPI 75 IPS, (1) 285 LPM printer, 16 line asynchronous multiplexor plus 8 additional not installed, 14 VT deluxe CRTs, (2) LA120 hard copy terminal printers with keyboards, (2) LA100 hardcopy terminal printers without keyboards (new). All inquiries regarding the sale of this equipment should be addressed to Mr. Dave Hays, Director Of Computer Services, PO Box 1817, Roswell, NM 88201, Telephone (505) 622-8528

REAL ESTATE

REAL ESTATE PROPERTIES WANTED
Buyer will consider all terms, all areas, any type
(213) 352-4293
or (213) 353-2375
Anytime

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

DISK DRIVES AND PACKS

CDC DISK SPECIALS

9766 300MB New	$10,950
9766 300MB Demo	9,500
9775 575MB Fmd	15,900
9762 80MB Used	3,700
9762 50-60HZ Kits	295
Fujitsu 160/474MB	Stock

All Models in Stock • Buy and Sell
All Warrantied • Subject to Prior Sale
SYNTEL CORP. (919) 781-3021

HEWLETT PACKARD

For Sale
HP 3000 Model 42
1 Meg Memory
(16) 2624A Terminals
(9) With Thermal Printer
180 CPS Printer
400 LPM Dot Matrix Printer
400 Mb Disk Drive
Digital Magnetic Tape Drive
Call Mr. Pepir At (305) 358-0077

NCR

SPREADSHEET SOFTWARE
IDPS/IMOS $450 IRX $495 VRX $1000
30 DAY TRIAL - $75
SOFTWARE PRODUCTS CO.
P.O. Box 18814
Wichita, KS 67218
(316) 682-1762

MISC. SYSTEMS

Buy • Sell • Lease
DATAPOINT
Cougar Computer Corp.
Suite 219
26250 Euclid Office Plaza
Euclid, OH 44132
(216) 261-3500

DATA GENERAL

FOR SALE OR ASSUME LEASE

1	8622-RA	Eclipse C-150 Computer with 256K Bytes ERDC MOS Memory & Battery Backup
1	8537	Expansion Chassis
1	4251	4 Slot Chassis
1	4254	Data Control Unit
1	4255	8 Line ASYNCH Multiplexor
1	4068	Programmable timer
1	4065	Subassembly I/O Interface
1	6067-N	50 MB Disk Drive with controller
2	6106	D-200 CRT Screens
1	6109-J	D-200 CRT w/Prntr Post
1	9600	300 LPM Printer
1	6021	800 BPI Mag. tape drive

Contact Lake Gibson at
(404) 532-7571
at Mansfield Oil Company

DATA GENERAL

6234 50MB Disk Sys	$8,400
6160 73MB Disk Sys	$14,400
6161 147MB Disk Sys	$19,200
6122-A 277MB Disk	$20,000
6125 Tape System	$5,500
6732-N S/120 256KB	$8,000
8716 C/150 1MB Mem Bd	$8,200
4342 ATI-16	$3,000
8529-D MP/100	$750

Ames Sciences
(301) 228-9100

HEWLETT PACKARD

HP3000 User Group
Conference and Vendor Show
September 14-16, 1983
3 days $150 Come
and talk to the HP experts
Presented by the Southern California Regional User Group
P.O. Box 12307
El Cajon, CA 92022
(619)442-1848

HP 3000
BUY & SELL
Complete Systems
Memory • Terminals
Disk Drives • Tape Drives
Miscellaneous Parts
ConAm Corporation
(Formerly Finley & Associates)
(800) 843-4864
(212) 468-2643

NCR

Due To Our Growth We Must Sell Our NCR N8450 To Upgrade.
N8450 CPU, 640 K Memory, 1-Very High Speed Trunk, 1-Low Speed Trunk, 1-integrated Disk Controller, 6-657 Disk Spindles, 30 Mb Per Spindle With Controller, 2-633 Tape Drives With Controller. The Above Equipment Under Continual Maintenance. Make Offers To
Teachers Credit Union,
1525 Locust Street, Philadelphia, PA 19102, (215) 545-0110

NCR 8231 With 96K Memory, (2) 10 Mb Rack Mounted Disk Units, (1) 10 Mb Stand Alone Disk Unit, Cassette Unit, Stand By Battery, (3) CRTs, (1) 200 LPM Band Printer With Quiet Cabinet, (1) 55 LPM Matrix Printer. Under Current NCR Maintenance. Software Option Available. All Or Part. Call Andy Jackson Or Mike Schere At (402) 228-7600

MISC.

BUY AND SELL
NEW • USED • SURPLUS

Data General	Digital
Printronix	CRT Terminals
Data Products	CDC Disk
TI Terminal	Hewlett Packard
Diablo	Wangco

STC Tri Density For DEC VAX
SYNTEL CORP (919) 781-3021

FOR SALE
(2) Sycor Model 445 Computers, each with
• 10MB disk drive
• 160K memory
• 4.1 release software
• (7) 15" 2000 character displays with 75 key typewriter
• (1) 120 CPS Sprinter printer
• (1) 80 MB disk drive with two disk packs
• All necessary cables and interfaces
Some equipment is nearly new
Immediate delivery
Paging Network, Inc.
14901 Quorum Drive
Suite 740
Dallas, TX 75240
Contact Terry Scott
(214) 458-9400

HONEYWELL

FOR SALE H-3200
Complete systems - 256K memory (13) tapes, (1) nine track drive, (2) 279 disks, Price negotiable.
Contact:
C. DiCostanzo
Auto. Insurance Plans Service Office
(312) 987-0500 ext. 273

WANT TO BUY
USED LEVEL 6
OR DPS 6 SYSTEM
Also 900 lpm printer. Call or send info. per configuration and availability. To: Fred Wolford, CD Systems Inc., 14614 Grover Street, Omaha, NE 68144, (402) 330-2310

L62, L64
L6000, L6600
PERIPHERALS
TERMINALS
URS
66 Montvale Ave.
Stoneham, MA 02180
(617)438-4300

DG ECLIPSE C350

2MB Memory, (2) 6061's 192MB Disk S/S, 6026-A, 1600BPI Mag Tape S/S, 2 Printers and Communications Features Included.
Contact R. Medina (305) 871-6270

DG MV8000/6000 Memory
2 Mb, 512 Kb & 256 Kb
Memory Boards Available
Liberal Trade-In Allowance
For Your 512 Kb And 256 Kb Boards
International Computing Systems Co.
(612) 941-2941

NPA SYSTEMS INC.
BUY, SELL, LEASE
Fully Stocked 10,000 sq. ft. warehouse
Service available in New York
Call for Price Catalogue
(516) 467-2500

BURROUGHS

BUY SELL LEASE
All Systems & Peripherals
AVAILABLE
• B1855 Sys • B1955 Sys
• B80s • B600s
(Configured To Your Specs.)
SPECIAL: B1855 MEMORY
• SRI Terminals model 100 & 110
• TD830s, MT983s, MT985s
• 206 & 207 Style Disk Drives
• Various Tape Sub-systems
• Memory Upgrades
• Printers 9248 & 9249 Styles
Guaranteed Burroughs Maint. Depot Maintenance Available
COMPUTER PROVISIONS
(216) 292-3774
(Member ISDA)

BUY • SELL • LEASE
B1700 • B1800 • B1900
(Custom Config. Install. Avail.)
B20 through B7800
206/207/225/235 Disk
9248/47/49 Printers
Mag Tape Subsystems
TD830 • MT983 • SRI • Datamaxx
TU/DC/CP/TT Terminals
Installation & DEPOT M/A Available
UFP Corp. (312) 279-1160

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

SPERRY UNIVAC

NEW UNIVAC 1100/61 C2
Available Immediately, ITC Available, Maintenance Guaranteed, Very Large Discount - Configuration Includes - 3 (3) MB Processor, 2,000 MB Disk (2 x 4), (3) 6,250 Tape Drives (U-36), 1200 LPM Printer, 750 LPM Printer, GCS; 7 Ports and Modems.
Direct From Owner
(612) 451-4361 or (612) 451-5275

V-77 800 SYSTEM
(2) 256K CPU w/2 Pages WCS
(2) 8433/220 200 MB Disk Drives
(4) 10 MB Disk Drives
(2) 800 bpi Tape Drives
(2) 800/1600 bpi Tape Drives
(1) 300 LPM Printer
(1) 600 LPM Printer
THE EXCHANGE (206)644-7000
Ask for TOM BASS

MISC. SYSTEMS

MICRODATA SERIES 8000
Mini Computer System
with peripherals
8 month old
For Sale or Lease
Call Erik Ostebo
1-800-854-1073

Datapoint 6600
Model 4750
256K, 120 MB, 1-160CPS Printer,
1-340 Belt Printer,
3-CRT's, Will Divide
Phone Stan Nystrom
816-587-9459

WANG

WANG MVP SALE
128K CPU (2) 2236 CRT
2236 MXD MUX
2280-1 26MB Disk
2261W Printer $24,000

2280N-1 Disk
2281P Daisy Writer
2270A-1 diskette also available in stock
Contact Kurt Tetrault
ASSOCIATED COMPUTER PRODUCTS, INC.
800-243-9737

HOW'S YOUR SERVICE?
SERVMNT keeps track of Wang service on your VS, response times, open calls. Generates analysis & logbook.
Send for VS Product List:
Minicomputer Interactive Systems, Inc.
8550 Firestone Blvd. Downey, CA 90241
24-Hr. Number (213) 862-1000

THE BIGGEST WANG
dealer in Wang Equipment & Plug Compatible has ADVANCED PRODUCTS!
* VS-80 to 2 MEG
* VS Universal IOP
* 2200 DPU for Phoenix and 300 MEG
CALL STANDARD DATA
Advanced Products Department
800-526-0791 201-884-0920

For Sale
WANG OIS-130
Refurbished
Incl: CPU, 10 Meg Disk, Wk. Sta. & Daisy Ptr. $13,500
617-372-8536
Mr. Dwight Krantz

WANG

Pssst... WANG USERS.....
HAVE YOU HEARD ABOUT THE GROUP OF FORMER WANG EMPLOYEES IN ATLANTA WHO BUY & SELL USED WANG EQUIPMENT AND PLUG COMPATIBLES?
I.C.A. (404) 977-4388 or 1-800-241-3159

Call
1-800-343-6474
to place your ad

IBM

WANTED
IBM SYSTEM 34
D-24 96K/64 MEG
MIKE HARDMAN
419-243-4185

SYSTEM 36
Available Today
Plant order #372DVZ, DWA, DWB
Express Leasing Inc.
(619) 489-7800

IBM

SYSTEMS 34/36/38
Lease or Sale
WANT TO BUY $/34's
(FOR INVENTORY)
Models & Peripherals
WE PAY CASH
LEAS PAK INTERNATIONAL
Tel.(817)268-0023

SYSTEM/36's
Avail. Now
For Sale Or Lease
* S/34 Trade-ins *
STAR DATA SYSTEMS
(512) 822-8582

For Lease
IBM System 34
256K Memory
128M Disc
Contact Ken Riggs
(617) 235-0733

Wanted Immediately
4341 Group 1
With Peripherals
Call Pacific Advertising
(213) 450-6422

FOR SALE
S/38
1024 K CPU
256 MB Disk
3262 Printer 600 LPM
Available Now
Call Ron Gibb
(914) 238-9631

SYSTEMS 36 LEASES
RATES LOWER THAN PRIME
PROCOM
(212) 279-1717

Operating leases!
System/36's
We beat IBM month-by-month rates by 10-40% on multiple installations. Will handle site-by-site and take 34's in trade. (203) 222-0170.
DATALEASE

FOR SALE
IBM 3350 Model A2F
IBM 3350 Model B02
IBM 2821 Model 001
IBM 1403 Model N01
Contact:
Nole Scott
Kamtar Incorporated
(514) 694-1483

IBM SYSTEM 34 MODEL F37
256K main storage, 128 meg disk, Wrkstn exp ft, B diskette magazine, 5211 printer attachment, 39.5 with September 10th availability
Contact: DP Manager
Grund Fos Pumps
3555 Clovis Avenue
P.O. Box 548
Clovis, CA 93612
(209) 299-9741

Datamaster
Model 424 - 64K
2 MB Word Processor
5242-2 Printer
Call Ron Gibb
(914) 238-9631

SYSTEM/36
Check Our GREAT Lease Rates
SYSTEM/34
We want to buy
MIDLAND FINANCIAL
612-559-7171

FREE IBM-PC
With purchase of System/34
Call
Southwest Computer Sales Inc.
(512) 828-1239

IBM

SYS/38
Model 581
3370's, 3411-003
5251's, 5256's
3262, 5291's
Available Now
Dealers Welcome
612-339-3042

For Sale
IBM Displaywriter
Available Immediately
Midland Financial, Inc.
(612) 559-7171

2501B2
FOR SALE
(717) 652-5540

IBM 370/138
1 Meg
4 ICA ports
IFA
Available Immediately
Certified
Contact:
Tony Bishop
(918) 584-4241

FOR SALE
IBM SYSTEM 34
256K with 257MB Disk, 2 Comm lines, expanded workstation facility, 5211 printer. Contact Kellie at (602) 887-5010.

BUY..SELL..LEASE
CRT's & Printers
5291's, 5224's, 5225's
Available immediately with complete IBM systems. Call regarding our flexible lease plans.
CERES CAPITAL CORP.
(212)279-4467
(713)627-7724

3031-6
Lease 6-18 Months
Call James Conole
Helix Leasing, Inc.
(619) 584-8963

System/38s
(2) Model 7GA
(1) Model 581
(6) 3370s, (3) 3411s, (4) 5225s
(80) 5251/11, (6) 5251/12, (1) 3203
(2) 5224s, (2) 3262s
Communications on all models
Peripherals sold with systems only
Bob Stout (404) 433-2500

IBM
System 34
128MB/128K
Communication
with Autocall 5211 printer
Greg Satusky
(315) 732-5166

Buy • Sell • Lease
IBM
Cougar Computer Corp.
Suite 219
26250 Euclid Office Plaza
Euclid, OH 44132
(216) 261-3500

S/34
128 K CPU - 128 MB Disk
5211-2 Printer
5251-11 Displays (2)
Call Ron Gibb
(914) 238-9631

For Sale Or Lease
3178 3278
Quantity Available Now
Dana Marketing
(800) 433-4148
In CA (213) 372-8845

IBM

For Sale or Lease
Qty 3278-2
As low as $30/month
(2) 3287s 3274-C31
(3) 3350-B2's $400 Mo.
Call EXECOMP Collect
(813) 799-4310 (612) 292-9922

S/34 S/38 43XX
Upgrades Peripherals
Available Now
3274 1C, 3278-2, 3287-1
Vargo Companies
313-254-2850

FOR SALE
3747-1
w/1660 & 7885
Available Now
Call Matt Blaustein
(914) 238-9631

PRINT TRAINS
IBM 1416 & 3216
Bought - Sold - Lease
Repaired - Reconditioned
COMPU-ACT COMPANY, INC.
(613) 863-2461

DEC

FP11A	$1185
BDV11-AA	$485
KK11-B	$2875
PDP 11/34A-DC	$3350
RX11-BA	$1185
VAX 1MB MS730-CA	$3,950
VAX 1MB MS750-CA	$3,950
11/34A CPU Set	$1,585
11/44 KE44-A 'CIS'	$2,975
DZ11 MUX Brd.	$1,125
DR780-AA	$11,200
4A-MS780-C Spares Kit	$7,800
MSV11-PK	$1175
MSV11-PL	$1575
FP750	$5100

CALL RAY
(617) 275-6800

Call For Your DEC Needs

881-C	$300	BA11-KE	$1,650
DD11-CF	$350	DL11-W	$425
DZ11-A	$2,195	H754	$295
RH780	$5,995	RKV11	$595
RP06-BA	$16,000	TU45-KE	$3,995

Pacific Computer Sales, Inc.
(408) POP-1170
Telex 172337

USED DISK PACKS
Guaranteed
RL01, RK06, RK07
Used VT52 CRT's
ADM-36, New
1134A, Used
ESS (701) 237-0689

DEC SPECIALS
• RP07-AA, Call
• TGU77-AB, Call
• VAX 11/780, Call
• RP06-BA, $16,000
• VAX 11/730, Call
SEVCO INC. (617) 435-6938

BUY • SELL • TRADE

1123-AA	$3495	MS11-LD	$1395
1134A	$3995	MSV11-DD	$ 295
DLV11-J	$ 450	RH780	$2995
DMC11-AL	$1195	RK711-EA	$5700
DMC11-MD	$1095	RP04/6-C	$2995
KDF11-AA	$ 875	RP06-AA	$13500

NEW YORK COMPUTER EXCHANGE
(516)752-8088 (800)645-9109

DEC NEW & USED
BUY — SELL — EXCHANGE
Systems • Processors • Memory
Options • Peripherals • Modules
LAKEWOOD COMPUTER CORP.
(408)266-2545

ORDER FORM

COMPUTERWORLD BULLETIN BOARD

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. **Computerworld** comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications include Burroughs, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Sperry Univac, Salvage, Terminals, Misc. Systems and Miscellaneous.

Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be cleanly typewritten. Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $115.00 (One unit minimum and no fractional units allowed.) There are no agency commisions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Date(s): _____

Signature: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Send this form to: .

COMPUTERWORLD BULLETIN BOARD

375 Cochituate Road, Box 880,
Framingham, MA 01701

617-879-0700 800-343-6474

SOFTWARE FOR SALE

PDP-11 & VAX USERS

Make your mini perform like a mainframe

High performance. You need it when you go on-line. And you get it with CYX. You don't need a mainframe to build high performance on-line application systems vital to your day-to-day operations. Not even when you have a large number of concurrent users or a huge data base. With CYX, your mini will deliver the kinds of throughput rates and response times you once could only get with a mainframe.

The CYX Transaction Processing System gives you high performance and reliability because it:

- Manages block mode communications using 3270 (or compatible) terminals and fully buffered DV11 (or compatible) multiplexors.
- Keeps frequently accessed records in a dynamically controlled record cache.
- Synchronizes concurrent accesses at the record level.
- Optimizes disk throughput by distributing files across multiple drives.
- Reorganizes the data base dynamically.
- Allows spawning of frequently used processes.
- Provides transaction rollback, duplicate data recording, data journaling, and automatic restart/recovery for high reliability and system integrity.

Find out how to get top on-line performance with CYX and your PDP-11 or VAX by talking to Cytrol today.

"High performance software for vital business needs"

cytrol

4570 West 77th St., Edina, MN 55435 Phone 612/835-4884
In the Northeast, contact: Russell Gloor 914/782-7822

HP3000 BUSINESS MANAGEMENT SYSTEMS

- CJ/PAYROLL
- CJ/PERSONNEL
- CJ/ADVANCED GENERAL LEDGER
- CJ/ACCOUNTS PAYABLE
- CJ/ACCOUNTS RECEIVABLE

Written in COBOL II and utilizing V/3000. May be used as stand-alone modules or an integrated system complete with on-going:

SUPPORT-MAINTENANCE-ENHANCEMENT

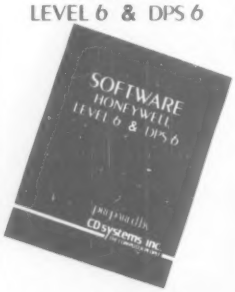
COLLIER JACKSON, Inc.

Call us today, or write our Corporate offices at 5406 Hoover Blvd., Tampa, Florida 33614
(813) 885-6621

We'll keep you up to date week, after week, after week, after week, after week, after week,

---

SOFTWARE HONEYWELL LEVEL 6 & DPS 6



PROVEN RELIABLE SOFTWARE FROM THE COMPUTER PEOPLE.

CD systems inc. THE COMPUTER PEOPLE

14614 Grover St., Suite 200
Omaha, Nebraska 68144 (402) 330-2510

VAX PDP-11 Application Software

- General Ledger
- Accounts Receivable
- Accounts Payable
- Payroll
- Job Cost
- Order Entry
- Inventory
- Fixed Assets
- Client Writeup
- Automatic Restart
- Tailorable
- Multiuser
- Multikeyed ISAM
- RMS Files
- Support Hotline
- Security System
- User-defined Forms
- Fully Documented

•Phone Demonstrations
•$1,000 to $3,500/module

Compu-Share
3824-50th Street
Lubbock, Texas 79413
(806)792-3785

Now available on TYMNET

IBM SYSTEM/38 BUILDING BLOCK SOFTWARE SYSTEM

RMS/38 offers full range of integrated applications for distribution, manufacturing and financial users. On-line systems using data base management. Menu driven. User friendly. RPG III code. Documentation and support. Ready to go. Ready to grow.

Call: (312) 932-2200

pcr professional computer resources

2021 Midwest Road, Oak Brook, IL 60521

S/23 S/34 S/38 FREE ADVERTISING

List your software in the most complete S/23, S/34 or S/38 software directory.

Contact:
Software Press
1523A N. LaBrea Ave., LA, CA 90028
(213) 785-3585

Analyze system and program performance on your

IBM SERIES/1

The Performance Analyzer for EDX systems measures and reports on resource utilization for single programs or complete systems.

H & A Computer Systems
30 Hotaling Place #204
San Francisco, CA 94111
(415)434-3517

SERIES/1 SPECIALISTS

S/38 DOCUMENTATION

Interactive/Menu Driven

- Catalog/VTOC
  Data Base Files
- Create
  File Layouts
  Program Narratives
  Flowcharts
- Display
  Program References
- Maintenance
  Easy, On-line
- Reduce
  Documentation Time

Cost: $650

The Software Consultants
127 Thoreau Drive
Shelton, CT 06484
(203) 736-2348

FOR THE IBM S/38:

- FINANCE/38™
- FUND ACCOUNTING/38™
- CONSTRUCTION/38™
  Accounting & Financial Management Systems
- WORKSHEET/38™
  True S/38 Spreadsheet
- JOB ACCOUNTING/38™
  Resource Tracking Monitor

Finance/38, Fund Accounting/38, Construction/38, Worksheet/38 & Job Accounting/38 are trademarks of New Generation Software, Inc.

See our full line of software at the **Software Expo**, Space 344 **September 13-15** McCormick Place, **Chicago**

NGS

NEW GENERATION SOFTWARE, INC.
341 Lincoln Street, Roseville, CA 95678
Phone **916 969-8446**
Outside California **800 824-1220**

SYSTEM/36 NOTICE

In September, Scope Publications will be publishing SCOPE/36, the technical journal for the IBM S/36. For sample issue contact:

Scope Publications, Inc.
Dept. S36-C
P.O. Box 1252
Maitland, FL 32751
(305) 645-2351

CHECK-DIGIT IN 8 INSTRUCTIONS

S/370 ASSEMBLER ROUTINE WILL CALCULATE A MOD-10 CHECK-DIGIT IN ONLY EIGHT INSTRUCTIONS (PLUS LINKAGE) FOR ANY NUMBER UP TO FIFTEEN DIGITS IN LENGTH. MAY BE USED AS AN ASSEMBLER SUBROUTINE OR AS A CALLABLE MODULE. FOR SOURCE LISTING, SEND US $200 TO:

I.SAVANT SOFTWARE
P.O. BOX 38A
GPO MELBOURNE 3001
VICTORIA AUSTRALIA

software for sale | software for sale | software for sale | software for sale | software for sale

Need general accounting software for IBM System/38?

We've simply solved your problem.

LAWSON ASSOCIATES has solved it with the first general accounting software specifically designed for IBM System/38. Not merely compatible, but state-of-the-art to fully utilize your computer's capabilities. Compare. You won't find a total software solution like it anywhere else.

DESIGN FEATURES: They include: on line systems using data base management; menu driven, user friendly programs written in RPGIII, the System/38 language; and integrated modules. Their benefits: ease of installation and use, plus maximum employee productivity.

INTEGRATED MODULES: Those available include: General Ledger and Report Writer/Accounts Payable/Accounts Receivable/Fixed Assets/Payroll/Purchase Order Order Entry/Inventory Control

SERVICE FEATURES: Fully documented and supported. Onsite training and implementation. One year warranty. Available now for immediate installation.

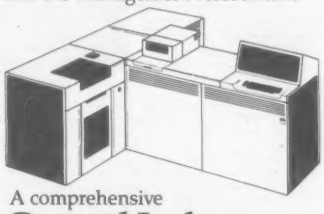
For more information, please call or write:

NATIONAL SALES:
Lawson Associates
2021 East Hennepin Ave.
Minneapolis, MN 55413
(612) 379-2633

IN TEXAS:
Lawson Associates
5001 LBJ Freeway, Suite 175
Dallas, TX 75234
(214) 233-4474

LAWSON ASSOCIATES
WE SIMPLY SOLVE PROBLEMS

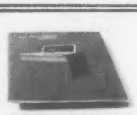
Designed specifically for the
IBM System/38
and the Management Accountant



A comprehensive
General Ledger, Financial Reporting and Budgeting System
with an integrated, optionally available
Accounts Payable System

DHDial & Company
Financial Accounting and Reporting Systems

Murray Financial Center, Suite 465
5550 LBJ Freeway, LB-1
Dallas, Texas 75240 • (214) 458-0987



Elegant Software
for IBM S/34, 36 and 38

General Accounting	Payroll/Personnel
Financial Reporting	Property & Equipment
Accounts Receivable	Report Writer
Accounts Payable	Oil & Gas
Order Processing	**All Systems are:**
Inventory Management	RPG II/RPG III
Sales Analysis	Data Base
Job Cost	Interactive

J.D. Edwards & Company
4949 South Syracuse Street/Suite 5500
Denver, CO 80237
303/773 3732

Dallas — 214/458 0636
Houston — 713/880 8278
Northern California — 415/697 7754
Southern California — 714/751 5302

Changing Computers?
Retain your SOFTWARE INVESTMENT

Dataware's conversion approach provides the solution to management's conversion problems and facilitates the recovery of the initial capital investment in systems development.

- **COBOL to COBOL**
- **AUTOCODER/SPS to COBOL**
- **EASYCODER/TRAN to COBOL**
- **BAL/ALC to COBOL**
- **DOS/ALC to OS/ALC**
- **PL/1 to COBOL**
- **RPG/RPG II to COBOL**
- **RPG/RPG II to PL/1**

Faced with Conversion? Call or write today

The Conversion Software People
Dataware, inc.
2565 Elmwood Avenue
Buffalo, New York 14217
Phone (716) 876-8722
TELEX: 91519

ATRIS

The comprehensive system for internal control

ATRIS was designed for and has been used by one of the world's leading banks for more than two years. It provides them with the degree of control over operations and procedures that was previously thought impossible. Implementing ATRIS has saved the bank its development costs many times over! Now ATRIS is available for all companies to benefit from its unique capabilities.

ATRIS provides:

* Hardware and software trouble reporting
* Systems status inquiry capabilities
* Statistical utilization data on your systems
* Reliability data on your systems and vendors
* Vendor invoice verification
* Capital and leased equipment inventory control
* Project and task management
* plus much, much more ...

ATRIS's online, real-time operation and multi-user, multi-location support guarantee that the critical information you need to run your organization efficiently is always complete and accurate.

Please call or write today for more information.

EMS
Thomas P. Sworney
Electronic Methods & Solutions, Ltd.
One World Trade Center, Suite 7967
New York, New York 10048
(212) 524-7774

Specializing in IBM System/38

FRIEDMAN & ASSOCIATES, INC.

10 Wimbledon
Deerfield Beach, Florida
(305) 428-0808

Totally on-line order entry, complete manufacturing systems, MRP with on-line net change

- Fixed price software including customizing
- Management consulting
- Ten years experience

We make it work!

IBM 34/36/38

Para Research offers a different marketing approach for software. We provide the best software packages at lower prices. We do this to obtain volume sales, a larger user base and to encourage user feedback. This approach and the input of our many users have made us what we are today: the world's largest distributor of System/34 software. All packages are completely documented.

WORD PROCESSING

Easy Text, a new word processing system for the IBM System/34 or 36, presents an easy-to-use system with on-line documentation. Easy Text is so "user friendly" that users with no experience can generate letters, memos, reports and mass mailings almost immediately. Now every workstation on your computer can function as a word processor. Easy Text on the System/34/36 is $750. On the System/38 it is $1,500.

Priced at $1,000, Paratext is the most successful and complete word processing system available for the System/34. There are more than 2,500 Paratext users. Paratext offers full-screen text editor, automatic justification, individual forms design, viewable corrections, heads-down typing, word wraparound, variable data insertion, label printing and math capabilities. Paratext is also available for the System/38 at $1,500.

FINANCIAL MODELING

Easy Calc Management System for the IBM System/34 or 36 combines the best features of the best electronic worksheets. Use Easy Calc for budgeting, cash flow analysis and sales forecasting. Build formulas of up to 96 characters. Create worksheets with 52 columns and 999 rows. Consolidate 998 worksheets into one. And Easy Calc's built-in error detection actually pinpoints the exact position that needs correction. Learn Easy Calc in only a few hours. Available for the IBM System/34 at $1,000, or the System/36 at $1,500.

Paracalc, a diversified modeling system, calculates budgets, cash flow, sales projections, commissions, production forecasts, anything you can set up in rows and columns. Change one entry and all amounts are recalculated accordingly in up to 24 columns and 400 rows. The "HELP" screen displays all built-in functions and provides the formulas to access each function. Consolidation from many models to one. Return on investment model. Available on the System/34 or System/38 for $1,000. With over 2,500 users, this is the most successful package of its kind.

GENERAL LEDGER

General Ledger is a fully-automated package for maintaining business records. It offers maximum flexibility, ease of use and a variety of reporting options. Users can produce trial balances; detailed income statements and balance sheets; reports for individual transactions; and all department and expense statements. General Ledger interfaces with other Para Research accounting systems. Available for $1,000 on the System/34, $1,200 on the System 36 and $2,000 on the System/38.

ACCOUNTS PAYABLE

Accounts Payable reduces administrative and clerical costs, while allowing tight control over accounts payable functions. Various management reports provide timely and accurate information on the current status of all payables. The enhanced version allows you to: take a discount amount after discount date; select a single batch of vouchers for updating to open payables file; and report status of every vendor on a vendor analysis report. Available for $1,000 on the System/34 and $1,200 on the System/36.

PAYROLL

Payroll reduces clerical costs and gives users control over payroll processing. The employee master files for salary, hours and other payroll items are easy to maintain, and user-friendly prompts provide instructions for each procedure. Payroll will handle 99 companies and will run payroll processing for any combination of companies. Available for $1,000 on the System/34, $1,200 on the System 36 and $2,000 on the System/38.

FIXED ASSETS

Fixed Assets, an easy-to-use depreciation scheduling program helps users produce two-year projections. It figures depreciation for user-specified periods based on the 1981 Economic Recovery Act using the Accelerated Cost Recovery System (ACRS) plus eight other depreciation methods. Management reports track depreciation schedules, report changes in those schedules, give projections over a two-year period. Available for $1,000 on the System/34, $1,200 on the System/36 and $2,000 on the System/38.

ACCOUNTS RECEIVABLE

Accounts Receivable improves bookkeeping efficiency and reduces administrative tasks. This system is available in either open item or balance forward methods. For both methods, the system has cycle billing capability and allows printing of all statements on file or statements for specific customers. You can obtain up-to-date status of customer records, including current balance, aging and credit checking. Available for $1,000 on the System/34 and $1,200 on the System/36.

BILLING

The Billing System provides order entry and invoicing capability as well as analysis of inventory and sale of items within your company. You can generate picking ticket listings by warehouse or item number and maintain data on orders before shipping and invoicing. The system places order quantities in reserve until you confirm the order, then reduces the quantity on hand. This allows you to enter freight charges before the invoice is sent. Available for $1,000 on the System/34 and $1,200 on the System/36.

INVENTORY

The Inventory System gives your company complete control over inventory, both on hand and on order. The system provides reports to let you know the status of every item at any time. You can determine inventory costs based on four methods: LIFO, FIFO, average cost and replacement cost. Available for $1,000 on the System/34 and $1,200 on the System/36.

PARA RESEARCH

Call or write Software Sales, Dept. CW13, Para Research Inc., 85 Eastern Avenue, Gloucester, MA 01930 (617) 546-3446, 546-3413.

TIME & SERVICES

"On Demand" Laser Printing Multi XEROX 9700

Print Only What You Need
REORDERS FILLED IN HOURS FROM TAPE MASTERS
Executive Quality
Large Type Selection

SPECIALIZING IN
- Financial Reports
- Direct Mail Campaigns
- On Demand Publishing

Competitive Rates—Around The Clock Shifts 7 Days A Week

Call: Al Kolovchevich
(212) 484-8303
WARNER COMMUNICATIONS
75 Rockefeller Plaza
New York, N.Y. 10019

TIMESHARING
VAX 11/780-VMS

- FORTRAN
- BASIC
- COBOL
- DATATRIEVE
- Telenet Access
- Floating Point Accelerator (Interactive Batch)
- Direct Dial

Graphics
Author Programs
Custom Software
Hydrology Softw.
Petroleum Softw.
Low Rates
Detailed Resource Acctg.

Volume Discounts
7-Day, 24 Hour Service
CONTACT: SHELDON SHEFTEL
IN-SITU INC.
999 18th St., Suite 1000
Denver CO 80202
(303) 293-2004

VAX AND PDP DEVELOPMENT TIME
NO KILOCORE TICK CHARGES / NO CPU CHARGES
Omnicomputer™
$7/$14
RSTS/E VMS
PER HOUR CONNECT TIME
BUDGET BYTES™ 212-944-9230
Omnicomputer, Inc.
1430 Broadway, New York, N.Y. 10018

TIMESHARING AVAILABLE
VAX 11/780-VMS
PDP 11/70-RSTS/E

- FORTRAN, COBOL, BASIC
- DATATRIEVE
- ORACLE ®
- STATISTICAL PACKAGES
- DECNET
- TYMNET ACCESS

CONTACT:
INSLAW, Inc.
Washington, D.C.
(202) 828-8600
® trademark of Relational Software, Inc.

Curtis Wright Computer Services
4341-2 370/158-3
VS1-CICS-ROSCOE-DOS
REMOTE JOB ENTRY
CICS DEVELOPMENT
CICS PRODUCTION
CUSTOMIZED SOFTWARE
CONTACT JOE BARRETT
(201) 777-3454
15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD RIDGE, N.J. 07075

RSTS/E TIME
CHICAGO AREA

- BASIC PLUS
- FORTRAN
- BASIC PLUS 2
- DIBOL
- PASCAL
- "C"
- MCBA SOFTWARE

$7 per hour connect time
No Kilocore Tick or CPU Charges
Symtec, Inc.
760 Industrial Drive
Elmhurst, IL 60126
(312) 941-9380

COMPUTER TIME & TIMESHARING

- We are time brokers.
- IBM timesharing our specialty.
- Also RJE & batch time.

Call John Rudder at
Computer Reserves, Inc.
(201) 688-5760

VAX 11/730-VMS
Use Any Language
Use Your Software or Ours
No CPU Charges
No Kilocore Tick Charges
Only $7.00 Per Hour
All Inclusive
(212) 775-7398

DEPOT COMPUTER REPAIRS
DEC-DG
ALL BOARDS
1-2 WEEK TURNAROUND
MEMORIES
POWER SUPPLIES
DISKS PACKS AND TERMINALS
ANY MANUFACTURER
DIGITAL DATA SYSTEMS, Inc.
1551 N.W. 65 Ave. Plantation, FL 33313
305-792-3290
1-800-327-8662
TELEX-232005 ATT DIG

COMPUTER TIME FOR SALE
On
IBM 4341-L10

- VM/CMS
- OS/VS1
- On-Site or Remote

ICCS
10 East 21st Street
New York, NY
Contact Ray Rauth
for Rate Sheet
(212) 557-0998

Tell everybody about the TIME & SERVICES you have to offer...

...in the Classified pages of COMPUTERWORLD.

To place your ad, send all materials to:

COMPUTERWORLD CLASSIFIEDS
Box 880
375 Cochituate Road
Framingham, MA 01701.

or call:

1-800-343-6474
(in Mass., (617) 879-0700)

ADVERTISERS INDEX

Access Telecom 66
Anadex, Inc. 7
Applied Data Research 3
Applied Technology Associates 30

BDS Computer Corp. 13
Boeing Computer ID/15

Caere Corp. 14-15
Cambridge Systems 92-93
CIE Systems ID/10
CIE Terminals 63
Cincom 28-29
City of Tampa 18
CMI Corp. 48,57
Comdata Corp. 65
Comspec 72
CRWTH Computer Coursewares 57
CS Computer Systems ID/14
Cullinet 76-77
CW Buyer's Guide 82
CWCI 91
CW Index 24
CW Micro 34
CW On Communications 80
CW Subscription 78
CW Supplement 96
CXI, Inc. 97

DASD 26
Data Access Systems 64
Data Architects, Inc. ID/9
Data Base Management ID/3
Data General 10-11
Data Processing Design ID/30
Datalex ID/2
Datamedia Corp. 60-61
Dataproducts ID/3
DEC/NPM-VAX 44-45
Deltak, Inc. ID/25
Develcon 67
Digital Pathways ID/18
Disk World ID/2
Dolen 76
Dorlen Products 31
Duquesne Systems Inc. 53
Durango Systems ID/9
Dynacalc ID/26
Dysan Corp. 41

EMC Corp. 89
EMCE ID/32,52
Equitable Life Leasing 32-33
ESPN 23
Execucom 90
EXO Corporation 38

Fusion Products ID/12

GECC 83
General Electric 58-59

Hambrecht & Quist 66
Hewlett-Packard 68-69
Hogan Associates 94
Hughes Aircraft 62

IBM 49
IBM-ISG ID/6
IDP 9
Informatics 31
Inmac 16
Intech 95
Invitational Computing ID/8
Issco 54-55

Local Data 39

3M 83
Management Decision Systems 74-75
MCBA ID/31
McCormack & Dodge ID/28-ID/29,128
Memorex 20-21
MicroAge 72
Microdata 70
MicroFrame 72
Mitron 39
Morino Assoicates Inc. ID/23
B.I. Moyle Associates ID/27
MTI 4,6,8
Multiplications ID/8
Munich Fair Authority 58

NCR Comten, Inc. 19
Netec ID/26
Northern Telecom 84-85

Omni Offices, Inc ID/22
On-Line Software ID/22

Perkin Elmer ID/24
Phaze Information Machines Corp. ID/14
PMS 39
Prime 86-87

R.L. Roper 16
Rolm ID/20

SAS Institute ID/16-ID/17
Saturn Systems 79
Society for Information Management ID/13
Software Corp. of America 56
Synapse Computer 33
Syncsort 5
Sysed 39

Technical Analysis Corp. ID/4-ID/5
Technology Transfer 4088
Tektronix, Inc. 30
Televideo Terminals 36-37
Tone Software 26
Topaz Inc./Electronic Div. ID/12
Triangle Software 27

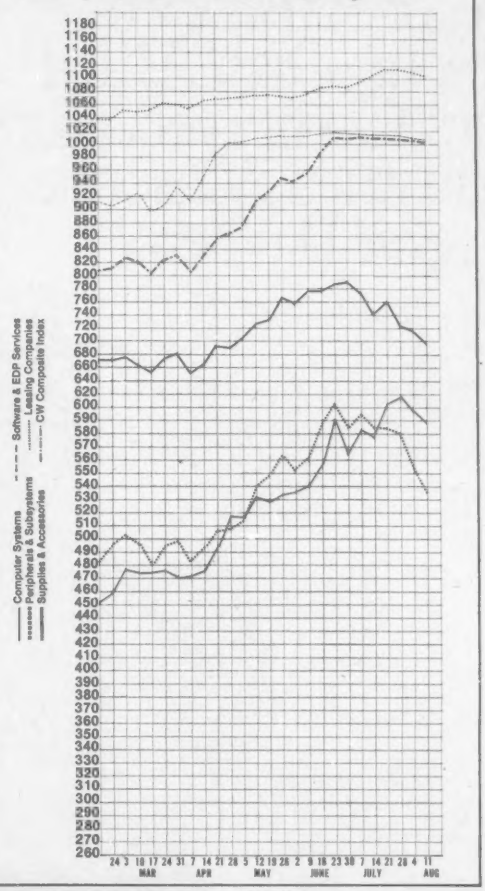
Ungermann-Bass 22
Unipress 26
United Telecom 71

Wang Laboratories 35
Westinghouse ID/19
Westwood ID/13
Winterhalter 25

Zenith Data Systmes 12

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



Computerworld Sales Offices

Vice-President/Sales/Donald E. Fagan
COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, MA 01701
(617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
Northern Regional Manager/Chris Lee
Sr. District Manager/Ed Marecki, Jr.
District Managers/Joe Fitzhugh, Jim McClure
Sales Assistant/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, MA 01701

CHICAGO SALES OFFICE (312) 827-4433
District Managers/Arthur Kossack, H. Newton Barrett, III
Sales Assistant/Jean F. Broderick
Northern Regional Manager/Chris Lee
COMPUTERWORLD, 2600 South River Road, Suite 304, Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Manager/Michael Masters
Sr. District Manager/Doug Cheney
District Managers/Ray Corbin, Joan Daly
Account Executive/Fred Lo Sapio
Sales Assistant/Gale M. Paterno
COMPUTERWORLD, Paramus Plaza I, 140 Route 17, North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 556-6480
District Managers/Bob Hubbard, Bernie Hockswender
COMPUTERWORLD, 18008 Sky Park Circle, Suite 260, Irvine, CA 92714

SAN FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Manager/William J. Healey
Account Managers/Barry Milione, A.C. Germano, Theodora Franson
Account Manager, Classified/Eileen Dunn
COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
District Manager/Jeffrey Melnick
Eastern Regional Manager/Michael Masters
COMPUTERWORLD, 1853 Peeler Road, Suite D, Atlanta, GA 30338

CLASSIFIED ADVERTISING (617) 879-0700
Al DeMille, Bill Cadigan
COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, MA 01701

CW INTERNATIONAL MARKETING SERVICES
Manager/Diana La Muraglia

For foreign sales offices, see masthead on Page 2.

CW COMMUNICATIONS/INC.

Board Chairman/Publisher
Patrick J. McGovern
President
W. Walter Boyd
Senior Vice-President
Lee Vidmer

Group VP-Communication Services, Jack Edmonston. **Group VP-Circulation,** Margaret Phelan. **VP-Marketing,** Donald E. Fagan. **VP-Finance,** William P. Murphy. **VP-Editorial,** John Whitmarsh.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701
Phone: (617) 879-0700, Telex: 95-1153.

SALES **Vice-President,** Donald E. Fagan. **Corporate Advertising Administrator,** Frank Collins. **Display Advertising Supervisor,** Anne Hadley. **Display Advertising,** Deborah Bryer, Pam Valentinas, Laura Kentley, Alice Longley. **Classified Advertising Manager,** William J. Mills.

COMMUNICATION SERVICES **Group Vice-President,** Jack Edmonston. **Director Research,** Kathryn Dinneen. **Sales Promotion Manager,** Noreen Kimball.

PRODUCTION **Production Director,** Peter Holm. **Production Manager,** Marlene Stibal. **Supervisor,** Trish Gaudette. **Systems Manager,** Tom Pfau. **Typesetting Manager,** Carol Polack. **Art Director,** Tom Monahan.

CIRCULATION **Group Vice-President,** Margaret Phelan. **Circulation Manager,** Barbara Jeannetti. **Service Representative,** Peggy Kelly. **Assistant,** Carmela Priante.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

Computerworld Stock Trading Summary

TRADE QUOTES

CLOSING PRICES WEDNESDAY, AUGUST 10, 1983

All statistics compiled, computed and formatted by TRADE QUOTES, INC Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE AUG 10 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	8- 30	18	-5 1/8	-22.1
N	BURROUGHS CORP	28- 58	50 1/8	-2 1/2	-4.7
O	COMPUTER AUTOMATION	7- 17	12 1/2	- 3/4	-5.6
A	COMPUTER CONSOLES	6- 28	20 5/8	-1	-4.6
N	CONTROL DATA CORP	21- 62	52 5/8	- 1/2	-0.9
N	CRAY RESEARCH INC	20- 52	46 3/8	-1 5/8	-3.3
N	DATA GENERAL CORP	20- 74	73	+4	+5.7
N	DATAPOINT CORP	11- 38	20 1/2	-1 1/8	-5.2
N	DIGITAL EQUIPMENT	62-132	98	-4 3/8	-4.2
A	EECO INC	6- 16	14 1/8	- 5/8	-4.2
N	ELECTRONIC ASSOC.	5- 15	13 3/4	- 1/4	-1.7
N	FLOATING POINT SYST	16- 44	36 3/4	- 3/4	-2.0
N	FUNDING	22- 47	36 5/8	+1 5/8	+4.6
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 16	12 5/8	+ 1/8	+1.0
N	HARRIS CORP	20- 51	37 5/8	-2 1/2	-6.2
N	HEWLETT-PACKARD CO	38- 98	84 1/4	- 3/4	-0.8
N	HONEYWELL INC	80-125	119 1/8	+ 1/4	+0.2
N	IBM	57-126	118 1/8	-3 1/8	-2.5
O	IPL SYSTEMS INC	5- 14	10 3/4	- 1/2	-4.4
O	MAGNUSON COMP SYSTS	2- 3	7/8	- 1/8	-12.5
N	MANAGEMENT ASSIST	7- 18	10 1/8	- 5/8	-5.8
O	MINI-COMPUTER SYST	1- 2	1 5/8	- 1/2	-23.5
N	MODULAR COMPUTER SYS	6- 18	13 3/4	-1 1/8	-7.5
N	MOHAWK DATA SCI	10- 19	12 1/4	- 1/8	-1.0
N	NCR	36-128	118	-1	-0.8
N	PERKIN-ELMER	17- 39	32 3/8	+ 3/8	+1.1
N	PRIME COMPUTER INC	11- 30	15 1/4	-1 1/8	-6.8
N	SPERRY CORP	21- 44	42 7/8	-1 1/8	-2.5
O	TANDEM COMPUTERS INC	14- 34	28 1/2	0	0.0
N	TEXAS INSTRUMENTS	71-178	107 1/2	-2 1/2	-2.2
A	WANG LABS "B"	13- 42	32 1/8	- 7/8	-2.6
A	WANG LABS "C"	11- 42	32 7/8	- 1/2	-1.4

LEASING COMPANIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE AUG 10 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 80	55	+1	+1.8
N	COMDISCO INC	7- 42	34 7/8	-1 3/8	-3.7
B	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	1	0	0.0
O	CONTINENTAL INFO SYS	3- 18	12	-2 1/4	-15.7
N	DPF INC	5- 14	11 7/8	-1 1/8	-8.6
O	ITEL	1- 3	1 1/2	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 47	39 3/4	+ 1/4	+0.6

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE AUG 10 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 8	5 1/4	- 1/4	-4.5
O	ADVANCED SYSTEMS INC	6- 22	18 1/2	- 1/4	-1.3
O	AGS COMPUTERS INC	7- 32	25 3/4	-2 3/8	-8.4
O	AMERICAN SOFTWARE	21- 31	24 1/4	+ 3/4	+3.1
N	ANACOMP INC	8- 23	12 3/8	- 1/8	-1.0
O	ANALYSTS INTL CORP	5- 20	17 3/4	- 1/2	-2.7
A	APPLIED DATA RES.	8- 37	27	+ 3/4	+2.8
O	ASK COMPUTER SYSTEMS	12- 38	32 1/4	-3 1/2	-9.7
B	ASTRADYNE COMP IND	1- 7	5	+ 3/8	+8.1
N	AUTOMATIC DATA PROC	21- 44	38 1/4	-3	-7.6
O	CGA COMPUTER ASSOC	5- 15	11 1/4	-1 1/4	-10.0
O	COMPUTER ASSOC INT'L	6- 35	28 1/2	-2	-6.5
O	COMPUTER HORIZONS	8- 20	13 1/2	- 1/2	-3.5
O	COMPUTER NETWORK	4- 10	8 3/8	0	0.0
N	COMPUTER SCIENCES	11- 23	18	0	0.0
O	COMPUTER TASK GROUP	8- 22	14 3/4	- 1/2	-3.2
O	COMPUTER USAGE	2- 22	18	+ 1/4	+1.4
O	COMPUTONE SYSTEMS	12- 38	12 1/4	-1 1/2	-10.9
O	COMSERV CORP	10- 20	10 1/4	- 1/2	-4.6
O	COMSHARE	8- 13	10 1/4	- 7/8	-7.8
N	CULLINET SOFTWARE	12- 50	41 1/2	+ 7/8	+2.1
O	CYCARE SYSTEMS INC	8- 27	19 1/4	+ 1/4	+1.3
O	DATA DIMENSIONS INC	1- 2	3/4	0	0.0
O	DATATAB	0- 2	1 3/8	-	-4.3
O	DYATRON CORP	2- 4	3 3/8	+ 1/8	+3.8
N	ELECTRONIC DATA SYST	10- 42	35 1/2	-4 1/2	-11.2
N	INFORMATICS INC	10- 34	24 5/8	- 5/8	-2.4
O	INSYTE CORP	1- 3	1 1/2	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	6- 15	11	- 1/4	-2.2
A	LOGICON	12- 44	38 3/4	-1 1/4	-3.0
O	MNGT SCI AMER INC	8- 33	25 3/4	- 1/2	-1.9
O	MATHEMATICA INC	12- 28	28 1/4	0	0.0
O	MATHEMATICAL APP GRP	12- 22	18	0	0.0
O	NATIONAL DATA CORP	3- 28	18 5/8	- 1/8	-0.6
O	PANSOPHIC SYSTEMS	8- 30	22 3/8	- 5/8	-2.7
N	PLANNING RESEARCH	8- 21	15 5/8	- 3/4	-4.5
O	POLICY MGMT SYSTS CP	38- 88	53 1/2	- 3/4	-1.3
O	PROGRAMMING & SYS	1- 6	4 3/4	- 1/8	-2.5
O	REYNOLDS & REYNOLD	17- 48	47 3/4	+ 1/4	+0.5
O	SEI CORP	11- 34	24	- 3/4	-3.0
O	SHARED MEDICAL SYST	13- 43	38 7/8	+2 3/8	+6.3
O	SCIENTIFIC COMPUTERS	8- 14	12 1/4	- 1/4	-2.0
O	SOFTWARE AG	5- 17	10	- 5/8	-5.8
N	TYMSHARE INC	12- 30	18 3/4	- 1/4	-1.4
A	URS CORP	3- 18	13 3/4	-1 1/2	-9.8
N	WYLY CORP	7- 17	13 1/4	+ 1/2	+3.9

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE AUG 10 1983	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	2- 7	3 1/2	0	0.0
A	ANDERSON JACOBSON	9- 28	18 5/8	- 1/2	-2.6
O	AUTO-TROL TECHNOLOGY	9- 28	27	+ 1/2	+1.8
O	BANCTEC INC	7- 33	18 3/4	-1 1/4	-6.9
A	BEEHIVE INT'L	4- 15	11 3/8	- 1/2	-4.2
A	BOLT,BERANEK & NEW	9- 60	45	-4 1/4	-8.6
O	CAMBEX CORP	2- 4	2 1/4	- 1/8	-5.2
N	CENTRONICS DATA COMP	6- 28	24	0	0.0
A	CETEC CORP	4- 12	9 7/8	- 1/4	-2.4
O	COGNITRONICS	2- 20	12 1/8	+ 3/4	+6.5
O	COMPUTER COMMUN.	1- 2	2	0	0.0
O	COMPUTER DEVICES INC	4- 21	6 3/8	-1 5/8	-20.3
O	COMPUTER TRANSCEIVER	4- 12	6 1/2	-1 1/8	-14.7
N	COMPUTERVISION CORP	18- 53	47 7/8	- 3/8	-0.7
N	CONRAC CORP	17- 38	20 1/2	- 1/4	-1.2
A	DATA ACCESS SYSTEMS	1- 4	1	0	0.0
A	DATAPRODUCTS CORP	18- 41	26	- 5/8	-2.3
A	DATARAM CORP	5- 12	10 1/2	- 7/8	-7.8
O	DATUM INC	2- 17	12 5/8	- 7/8	-6.4
O	DAVID JAMISON CARLYL	2- 7	2 3/4	- 3/8	-12.0
O	DECISION DATA COMPUT	3- 16	11 1/8	- 3/4	-6.3
O	DELTA DATA SYSTEMS	1- 4	2 5/8	- 1/4	-8.6
N	ELECTRO M & M	5- 11	7 7/8	- 1/4	-3.0
O	EVANS & SUTHERLAND	18- 50	41 1/2	- 1/4	-0.5
O	GANDALF TECHNOLOGIES	9- 22	10 1/4	+ 1/2	+5.1
N	GEN'L DATA COMM IND	6- 29	21 5/8	+ 3/4	+3.5
O	GENERAL TERMINAL CP	1- 2	1/2	0	0.0
O	GREAT SOUTHWEST IND	2- 8	2	0	0.0
N	HAZELTINE CORP	7- 31	23 3/4	+ 3/4	+3.2
O	ICOT CORP	3- 10	5 3/4	- 5/8	-9.8
O	INFORMATION INTL INC	10- 22	18 3/4	+2	+11.9
O	INTEL CORP	11- 45	38 1/2	-2 1/4	-5.5
O	IPL SYSTEMS INC	5- 14	10 3/4	- 1/2	-4.4
A	LUNDY ELECTRONICS	7- 19	18 3/8	+ 1/2	+2.7
A	MSI DATA CORP	14- 36	19 1/8	+ 3/4	+4.0
O	NETWORK SYSTEMS CORP	8- 34	28	-1 5/8	-5.4
O	OMEX	3- 8	6	0	0.0
N	PARADYNE CORP	15- 30	18 3/4	+ 1/2	+3.0
A	PENRIL CORP	7- 14	11 3/8	- 1/4	-2.1
O	RANTEK CORP	12- 26	15	- 1/2	-3.2
N	RECOGNITION EQUIP	4- 17	13 5/8	+ 3/8	+2.8
O	SCAN DATA	1- 3	2	- 3/4	-27.2
N	STORAGE TECHNOLOGY	18- 33	21	+1 3/8	+7.0
O	SYKES DATATRONICS	6- 27	8	- 3/4	-8.5
A	T BAR INC	7- 17	11 3/8	-1 5/8	-12.5
A	TAB PRODUCTS CO	8- 30	26 3/8	-1 1/8	-4.0
A	TEC INC	8- 12	7 3/4	- 1/4	-3.1
N	TEKTRONIX INC	34- 87	72 1/4	-2 3/4	-3.6
N	TELEX	5- 32	26 5/8	-1	-3.6
O	TESDATA SYSTEMS CP	3- 17	13 7/8	-1 1/4	-8.2
N	TIMEPLEX INC	7- 29	21 3/8	-2 1/2	-10.4
O	VISUAL TECHNOLOGY	9- 26	18 3/4	-1	-5.0
O	WILTEK,INC	1- 4	1 1/2	+ 1/8	+8.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE AUG 10 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 31	28 7/8	+ 3/4	+2.8
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 31	28 1/8	- 3/8	-1.3
O	CYBERNETICS INC	1- 2	1 1/4	0	0.0
A	DUPLEX PRODUCTS INC	12- 28	22 1/2	+ 1/4	+1.1
N	ENNIS BUS. FORMS	8- 25	21 7/8	-1 3/8	-5.9
N	3M COMPANY	48- 90	78 3/4	-2 1/8	-2.6
N	MOORE CORP LTD	28- 51	43 1/2	-1	-2.2
N	NASHUA CORP	9- 28	23 3/8	-1 3/4	-6.4
O	STANDARD REGISTER	11- 34	32 1/2	0	0.0
N	WALLACE BUS FORMS	11- 30	24 3/4	+ 1/4	+1.0

The man who designs software for American Can, American Greetings, Armour-Dial, Allied Van Lines, B. Dalton Booksellers, ComputerVision, Heublein, Hoover, Fairchild Industries, Masonite, Ore-Ida, Rand McNally and Lever Brothers.

John Landry, Senior Vice President, Research and Development

He's a member of the McCormack & Dodge software design team, recognized as the best in the world by many of the world's best companies. Companies whose standards for internal financial performance are so high that any software but the fastest and most powerful is simply out of the question.

McCormack & Dodge has never restricted the research process by tying it to product marketing. We see real research as pure research. Research without limits. Dedicated to elevating the state of the art, not just the profits in a particular package.

As a result of our R&D, we now routinely offer systems that our competition is still talking about offering. Borderless query that lets you choose an audit trail and follow it to completion, criss-crossing data bases as you go. Interactive PC link that lets you upload and download information to the mainframe from your own desk.

There's a world of difference between today's software tomorrow and tomorrow's software today. Because we offer the latter, there's a world of demand for McCormack & Dodge.

McCormack & Dodge

- ☐ General Ledger
- ☐ Payroll/Personnel
- ☐ Accounts Payable
- ☐ Fixed Asset Accounting
- ☐ Capital Project Analysis
- ☐ Purchase Order Management

Mainframe and minicomputer systems.

(800) 343-0325*

*Telex: 710-325-0329

Tomorrow's software today.

McCormack & Dodge Corporation, 1225 Worcester Road, Natick, MA 01760. Sales and support offices throughout North and South America, Europe, Asia, Australia and Africa.